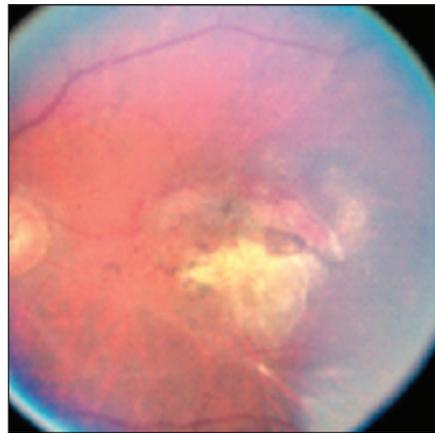


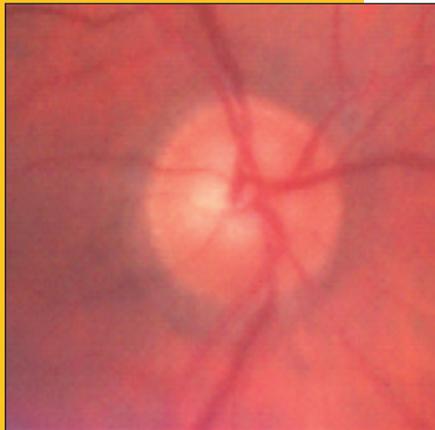
Detecting Glaucoma in Patients with Age-Related Macular Degeneration



Right Eye



Left Eye



The left eye of this patient shows a larger area of involvement of advanced ARMD and more glaucomatous cupping of the optic disc than the right eye.

Age-related macular degeneration (ARMD) and glaucoma are the two leading causes of visual impairment and irreversible blindness in patients older than 50 in the United States. Failure to diagnose glaucoma at an early stage can significantly worsen the prognosis. But in patients with ARMD, it may be difficult to examine for signs of glaucoma, notes Simon K. Law, M.D., Pharm.D., Assistant Professor of Ophthalmology in the Glaucoma Division of the Jules Stein Eye Institute at UCLA. Given the difficulty of administering other standard tests in ARMD

patients, looking for changes in the optic nerves is the most reliable way to detect signs of glaucoma.

Of the three approaches typically used to evaluate glaucoma, two are often ineffective in patients with macular degeneration, Dr. Law explains. Assessing the visual field of an ARMD patient is hindered by the patient's inability to look straight ahead. "If you have lost sight in the center, it makes it difficult to focus so that we can test peripheral vision, which we need to do to look for early indications of glaucoma," says Dr. Law. In addition, he notes, a great deal of nerve tissue is usually lost before defects on the visual field can be found. The second test, measuring the eye's pressure, also may not accurately reveal glaucoma, since glaucoma can be present in patients without high pressure. Thus, the third assessment tool – studying for changes in the appearance of the optic nerve – becomes especially important.

This point was underscored by a comparative study published in the July 2004 issue of the *American Journal of Ophthalmology*, in which Dr. Law and colleagues reported that eyes with large areas of age-related macular degeneration had optic discs that were more likely to be classified as glaucomatous, both by objective analysis with confocal laser ophthalmoscopy and by the subjective evaluations of glaucoma specialists, than eyes with less macular degeneration. The study suggests that widespread ARMD affects the retinal ganglion cell layer, producing alterations of the

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DETECTING GLAUCOMA *(continued from page 1)*

optic disc similar to glaucoma such as an increase of the cup-disc ratio, diffuse thinning of the neuroretinal rim area, and an increase of disc pallor.

The researchers noted that it is unlikely that these results are due to a common underlying pathophysiology shared by macular degeneration and glaucoma, though certain similarities, such as ocular perfusion abnormalities and degeneration by

sure consistently less than 22 mm Hg in both eyes. The probability of glaucomatous optic nerve damage was measured with both confocal laser ophthalmoscopy and by two independent observers according to a predetermined evaluation scale. While the nerves in a healthy person's two eyes typically look similar to each other, Dr. Law and colleagues found that in patients who had more severe

in cases of severe ARMD may be diffuse and the appearance of the nerve may be pale throughout, making it difficult to appreciate in the clinical examination, Dr. Law notes. The confocal imaging technology used to supplement the clinical interpretations in the UCLA study might not be possible in these patients, Dr. Law adds, since patients' ARMD could extend to the peripapillary area, and patients might not be able to fixate steadily for the imaging test. He suggests that in the absence of such tests, clinicians should be particularly aware of any asymmetry of the rim contour patterns between the patient's two eyes. Furthermore, Dr. Law recommends that clinicians obtain stereoscopic optic disc photos at 2X magnification from patients with early ARMD to use as a baseline for future comparison.

"It would be very helpful if more clinicians took these pictures early on," says Dr. Law. "But often, moderate or advanced changes in the nerve have already occurred when it is picked up." Regardless, he says, diligence must be paid to the optic nerve in ARMD patients. "It's easy to become so focused on the macula that we are not diligent about looking at the nerve," says Dr. Law. "Patients with macular degeneration are already losing their central sight. If their periphery is also affected, it becomes very debilitating. If we become suspicious of the glaucoma early, we can do something to try to preserve their visual function." 

"If patients have both severe macular degeneration and glaucoma in the same eye, accurate assessment of the optic nerve can become even more difficult."

apoptosis, may exist. Their findings do indicate that the papillomacular fibers and arcuate nerve fibers in the temporal, superior temporal, and inferior temporal portions of the optic disc can be affected when ARMD macular involvement is six or more disc areas.

"We're not implying that the two diseases are one and the same. Certainly, some patients can be affected by more than one ocular disease, but it's possible that for patients with macular degeneration in large areas on the back of the eye, their nerves are affected so that they appear to have glaucoma," Dr. Law says. "That's important to know, because it means that if patients have both severe macular degeneration and glaucoma in the same eye, accurate assessment of the optic nerve can become even more difficult."

In the study, Dr. Law's group retrospectively compared 45 patients ages 60 and older, all of whom had advanced ARMD with atrophy or disciform scarring in at least one eye and intraocular pres-

macular degeneration in one eye, the optic nerve in that eye appeared different from the other, with a decrease of nerve tissue similar to that experienced in glaucoma. Of 29 patients who had objective optic disc measurements obtained for both eyes, 24 showed different severities of macular degeneration when comparing the two eyes. In these cases, eyes with larger areas of ARMD were more likely to be glaucomatous.

"The message from these findings is that when we evaluate patients with macular degeneration, the optic nerve needs to be one more factor we consider along with everything else, for two reasons: the optic nerve may be affected by the large area of involvement of macular degeneration and appears to be glaucomatous, making assessment difficult; and the outcome of missing glaucoma in patients with severe ARMD can be debilitating," says Dr. Law.

Complicating matters is that the loss of the retinal nerve fiber layer

RECENT PUBLICATION

Law SK., Sohn YH., Hoffman D., Small K., Coleman AL., Caprioli J. Optic disk appearance in advanced age-related macular degeneration. *Am J Ophthalmol* 2004;138:38-45.

Hyaluronic Acid Gels for Aesthetic and Reconstructive Periorbital Filling

Blepharoplasty surgery is not always the best treatment for lower eyelid aesthetic concerns. An important example of an anatomic contour that does not improve with blepharoplasty is the tear trough deformity or orbital rim hollow. In the past, fat repositioning, fat injections, and silicone orbital rim implants have been used to address this hollow. The new generation of hyaluronic acid synthetic fillers provides an excellent, nonsurgical alternative to improve hollow facial contours, say Robert Alan Goldberg, M.D., and John D. McCann, M.D., Ph.D., Directors of the Aesthetic Center in the Jules Stein Eye Institute. Restylane® is the first hyaluronic acid gel to be approved by the U.S. Food and Drug Administration.

Drs. Goldberg and McCann observe that filling the orbital rim contour with hyaluronic acid fillers can be challenging. Irregular contours can easily be produced, and have led many practitioners to

abandon the technique. Patients with thin skin present a particular challenge, because any irregularity in the three-dimensional injection shape is easily visible. However, with practice, it is possible to place the filler in any carefully constructed diffuse three-dimensional layered configuration that can provide an acceptably smooth contour for filling the orbital rim hollow. The material remains in place for as long as 12 months; most often patients come in for maintenance treatments six to nine months following the injection.

Filling the hollow orbital rim contour with hyaluronic acid injections is a powerful adjunct or alternative to fat repositioning, fat injections, or orbital rim implants. Both aesthetic concerns, such as the orbital rim and zygomatic hollows, and reconstructive problems, such as eyelid retraction, can be treated. "Patients are delighted to be able to avoid surgery," says Dr. Goldberg. "These new fillers have



Figure 1. Restylane filling of the orbital rim hollow, combined with Botox for the orbicularis.

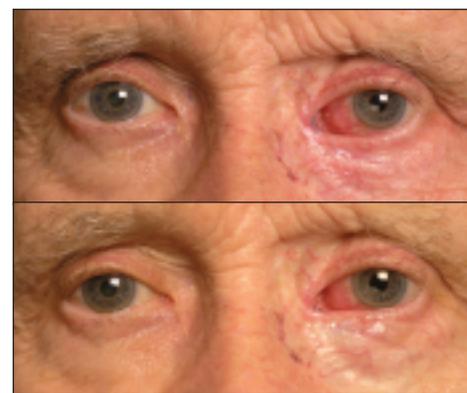


Figure 2. Left lower eyelid retraction from cancer treatment, improved following Restylane expansion.

an excellent safety profile and not only can help patients to avoid surgery, but also provide treatment options for some problems for which there are no truly effective surgeries." 

IOP Fluctuation: An Important Risk Factor for Visual Field Progression in Glaucoma

A number of studies over the last two decades have addressed the clinical risk factors for worsening glaucoma. A better understanding of risk factors could facilitate the development of new strategies to manage this disease. A primary obstacle has been the absence of effective methods for the detection of glaucoma progression.

A large clinical study performed by Kouros Nouri-Mahdavi, M.D., International Glaucoma Fellow; Anne

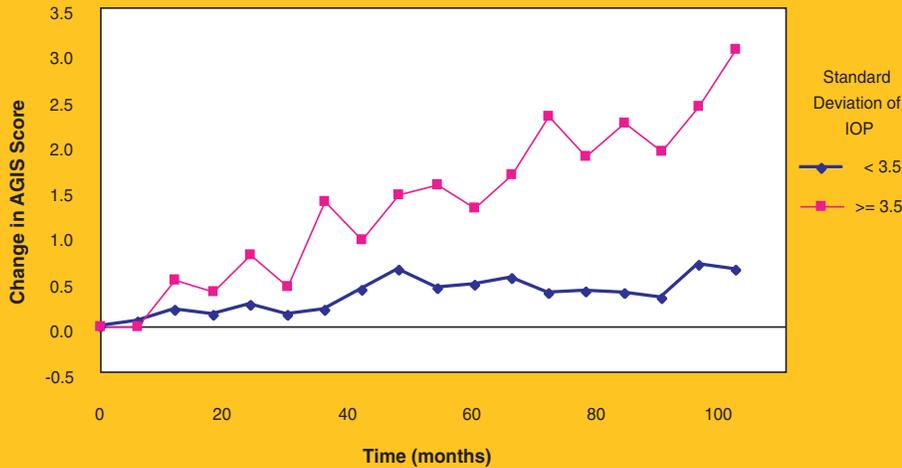
Coleman, M.D., Ph.D., Professor of Ophthalmology; Joseph Caprioli, M.D., Professor of Ophthalmology and Chief of the Glaucoma Division; and colleagues at the Jules Stein Eye Institute shows that age and intraocular pressure (IOP) fluctuation are associated with visual field (VF) loss over time. Patients had a 30 percent increase in the odds of progression of visual field damage for every five-year increase in age and 1-mm-Hg fluctuation in IOP.

The research team studied data from 509 eyes of 401 patients who were included in the Advanced Glaucoma Intervention Study (AGIS) to investigate the risk factors associated with progressive visual field loss. The patient population consisted of those with open-angle glaucoma from the AGIS who were no longer responsive to medical treatment. Patients were followed for an average of 7.4 years and had an average of 16 VF examinations. The

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IOP FLUCTUATION (continued from page 3)

IOP Fluctuation and VF Progression



The graph compares the progression of glaucoma damage over time in eyes with an IOP fluctuation of <3 mmHg and those with an IOP fluctuation of ≥3 mmHg. In eyes with a lower IOP fluctuation, the visual field remained stable during follow-up, whereas eyes with a higher IOP fluctuation had a significant field progression.

study focused on VF testing because it is the most common method used to evaluate progression and treatment efficacy in patients with advanced glaucoma. Visual field progression was detected in 151 of the 509 eyes.

Four main variables emerged that could be predictors for the progression of visual field damage, including older age at the time of intervention, greater IOP fluctuation, number of glaucoma interventions and having a longer follow-up.

After several analyses, only IOP fluctuation was consistently associated with progressive visual field loss in eyes both with and without a history of cataract surgery.

“The low correlation between IOP fluctuation and mean IOP during follow-up and the less significant P value for the latter after exclusion of IOP fluctuation from the multivariate analysis suggest that IOP fluctuation is an independent and stronger predictor than IOP for VF progression in the AGIS,” the researchers said. They went on to say that the individualized management of patients with glaucoma might be the reason that IOP fluctuation has not been distinguished as a risk factor for progression until now. 

RECENT PUBLICATION

Nouri-Mahdavi K, Hoffman D, Coleman AL, Lui G, Li G, Gaasterland D, Caprioli J. Predictive factors for glaucomatous visual field progression in the Advanced Glaucoma Intervention Study. *Ophthalmology*. 2004;111:1627-35.

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