

Lasers in...

Ophthalmology

Lasers save eyesight from diabetes, cataracts and glaucoma

*by David Cohen
(fourth in a series of articles on lasers in medicine)*

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The application of lasers to medicine, fruitful in numerous specialties, has been securely established in ophthalmology. Whether the illness is glaucoma, cataracts or the side effects of diabetes, eye specialists were the first to detect the advantages of the laser over conventional surgery. Because the cornea, the outer sheath of the eye, is transparent, laser intervention can usually be undertaken without surgically entering the body. Researchers, therefore, had fewer hurdles to pass while investigating its value.

“There is nothing experimental about the use of lasers,” comments Dr. Ernest D. Gutmann, an ophthalmologist at Ravenswood Hospital Medical Center. “They have been accepted in numerous procedures for years. People hear about cancer cures all the time that disappoint us. But the laser is here and available now, a definite tool.”

Progress in the application of lasers has intersected with improved treatment of diabetes in an especially valuable way. Diabetes, a pancreatic disorder promoting excess sugar in the blood, is slowly yielding to the attack of medical progress, and the new and extended life of a diabetic patient has serious implications for the treatment of eye disease.

“Fifteen years ago a retina surgeon like myself treated exclusively retina detachments,” commented Dr. George J. Wyhinny, a retina specialist at Ravenswood Hospital. The retina is the rear inner lining of the eye converting light into electrical



impulses. "But with the development of lasers in the treatment of retina disorders associated with diabetes, just one-third of my practice deals with conventional detachments.

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The use of the laser — an intense projection of light that permits painfree, bloodless surgery, that is inherently sanitary — has proven essential in ophthalmology because diabetic patients are now living longer than ever. In the U.S. today, 11 million people bear the affliction. The effect of diabetes on eyesight can lag for up to 13 years, and as diabetics live longer the probability of developing impaired vision grows. Indeed, diabetes-induced eye disease — called diabetic retinopathy — is today the number two cause of blindness in America, after macular degeneration.

Diabetic patients suffer from a restricted supply of oxygen in the bloodstream. To compensate for the loss, abnormal vessels grow inside the eye with insufficient wall strength. In time these vessels break and bleed, flooding the eye and blocking vision. With the laser, an eye surgeon can cauterize the abnormal vessel and seal the leak, thereby restoring vision.

A physician may also remove part of the retina with no loss of sight, a step reducing the total supply of oxygen needed and curtailing the threat of abnormal vessel development.

Retina detachments are also common, and here too the diabetic pays an extra toll for his illness. The scar tissue left behind by retinopathy treatment may detach the retina from the outer wall of the eye, impairing vision. But the laser may be employed to seal off the tear induced by the pathology.

"You need the laser to perform these procedures because the damage is too small to be treated with medical instruments," Dr. Wyhinny notes.

Other more conventional eye troubles are giving way to the instrument as well. Retina detachments occur when the vitreous fluid or gel forming the content of the eye seep behind the retina, separating it from the organ's back wall. Lasers can seal the tear, leaving no perceptible loss of vision.

The macula is at the center of the retina, controlling central vision and color perception. As the walls beneath the retina weaken with age, blood vessels external to the eye can burst through the macula and damage vision. Physicians have learned to use the laser to remove the intruding vessels and slow the deterioration.

These new retinal applications, important as they are, take a back seat to the treatment of cataracts and glaucoma. These illnesses account for the lion's share of the laser's role in alleviating eye disease. But patients, quick to learn of breakthroughs in medicine, have not been kept well informed. "Somehow word got around that lasers can remove cataracts," comments Dr. Gutmann. "But of course

it can't. A cataract is a clouding over of the lens of the eye, and we usually treat the deformity by removing the lens and implanting a new one. Lasers have never been used in this procedure.

"They come into play after surgery. In about 40 percent of cataract cases, a cloudy membrane forms in the capsule resting behind the lens. Patients suffering from this development before had to undergo surgery to remove the membranous capsule. But now we can clear a path through it with a laser and restore the patient's vision.

"As with all applications of the instrument, the procedure is painless."

In the past, glaucoma was a serious source of blindness. Fluids may accumulate in the eye when normal channels of drainage are blocked. As a result, pressure builds on the optic nerve, the delicate organ at the back of the eye transmitting visual messages to the brain. If medication doesn't reduce the pressure, the laser can be used to remove or bypass the occluding material. The procedure restores the normal offtake of eye fluid, and curtails the harmful pressure building up in the organ.

"The laser hasn't changed my practice, but it has offered patients a safer alternative to surgery," notes Dr. Gutmann. "In the past, some types of glaucoma surgery required bedrest and hospitalization. Now it's a simple out-patient procedure, and it's much less risky."