

eyelights



SINAI HOSPITAL
a LifeBridge Health center

The Aging Eye

Spring 2005

Each year there is an increase in the number of people entering the "retirement age." The quality of life for this population has certainly improved over the past 20 years, but the increasing prevalence of health problems that comes with the aging process has posed a challenge to health care professionals.

With increasing age we see an increased prevalence of eye diseases. Some examples include cataracts, glaucoma, droopy eyelids and excess skin around the eyes, and macular degeneration. These diseases occur more than ever before because people are living longer. The baby boom generation is aging, and the prevalence of age-related macular degeneration is expected to increase to nearly three million Americans in the next 15 years. In addition, we see difficult-to-treat eye problems, including diabetic retinopathy, retinal detachment, corneal disease and diseases of the retinal blood vessels.

At the same time, drug research is at a peak, and there are a tremendous number of new treatment modalities that have become available to manage these aging eye problems. These include new medications that have fewer side effects, new lasers to treat many eye problems and new surgical techniques. We are also learning to eat more healthfully, practice preventive medicine and seek medical help as soon as a problem develops. In this issue of *Eyelights*, we will present some of the more common problems of the aging eye.

Cataracts and Cataract Surgery.

Cataracts cause 15 percent of blindness in people age 45 and older. Our eyes have a lens, just like a camera, and when this lens becomes clouded, we call it a cataract.

In the eye, the lens sits behind the colored part of the eye, the iris, and focuses light, telling our brains what we see. When we are born, this lens is crystal clear. As we age, the lens becomes cloudier. This cloudiness is called a cataract. When light passes through the cloudy lens, it is no longer focused clearly and images appear blurry.

The most common type of cataract is an age-related cataract. However cataracts can occur at other times and for other reasons. Trauma to the eyes and certain genetic conditions may also cause cataracts to occur at an earlier age. In some cases, babies are born with cataracts, or cataracts may develop during early childhood. Diabetes and certain eye conditions such as iritis may accelerate the development of cataracts. Additionally, some medications, especially steroids, can hasten the onset of cataracts.

Adult onset age-related cataracts develop slowly and painlessly. People with cataracts usually describe blurry vision, difficulty seeing at night, problems with glare and halos around lights. When cataracts become more symptomatic, it becomes increasingly more difficult to see, even during daylight. The person with cataracts may have difficulty seeing street signs while driving.

Cataracts are diagnosed as part of a thorough eye examination by an ophthalmologist. At this time, the ophthalmologist measures vision and evaluates all the

structures of the eye with a special microscope. It is best to dilate the pupils during this examination so that the lens can be fully evaluated. The ophthalmologist can diagnose the presence of early cataracts before they cause symptoms. In such a case, the patient may not have any difficulty with vision, and the cataract is observed and followed because there is no indication for surgery at this early stage. When cataracts start to cause blurry vision, sometimes a change in the prescription for eyeglasses helps clear the vision. If eyeglasses cannot improve vision, and the symptoms of the cataract are bothersome, then the cataract can be removed with cataract surgery.

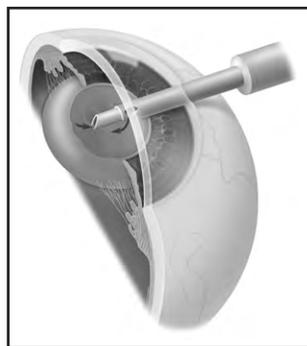


Figure 1A

Cataract surgery is performed in the operating room and takes place under an operating microscope using delicate instruments. (Figure 1A). In the eye, our natural

lens is supported within a delicate capsule. During cataract surgery, the cloudy lens is removed from the capsule by using ultrasound to break the cataract into miniscule pieces and then suctioning these from the eye. A man-made clear lens implant is inserted into the capsular bag (Figure 1B).

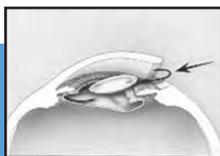


Figure 1B

A common misconception is that cataracts can be removed by lasers, but laser energy really cannot “remove” the cataract from the eye. In some cases, however, after cataract surgery, the capsule behind the lens implant becomes cloudy and laser energy can be applied to open the cloudy capsule. However, the original cataract surgery requires modern surgical instruments and procedures and is performed in the operating room.

Research and experimentation has made cataract surgery safer and more successful than ever before. Cataract surgery is one of the most frequently performed surgical procedures, and more than two million cataracts are removed every year in the United States.

Temporal Arteritis

Severe headache is sometimes associated with severe visual loss. Prompt diagnosis is extremely important and can be sight saving. This problem is caused by inflamed blood vessels and the condition is known as temporal arteritis.

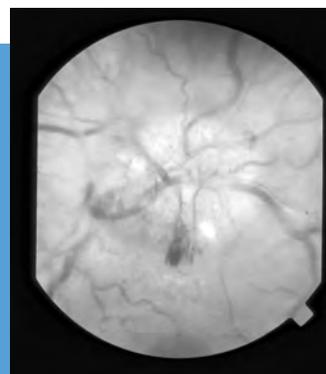
Temporal arteritis, also known as giant cell arteritis, is an inflammatory condition affecting the medium-sized blood vessels that supply the head, eyes and optic nerves. It usually affects those over 60 years of age and causes the vessels in the temple and scalp to become swollen and tender. Even combing the hair can be painful. Women are approximately four times more likely to suffer from this disease than men.

The major concern with temporal arteritis is vision loss. Profound vision loss is threatened when the inflamed and swollen arteries obstruct blood flow to the eyes and optic nerves. If untreated, permanent vision loss can occur from oxygen deprivation to the retina and optic nerve. If treated promptly, permanent vision loss can be prevented. The disease may be detected by the ophthalmologist who finds a swollen optic nerve (Figure 2).

Patients with temporal arteritis usually notice visual symptoms in one eye at first, but as many as 50 percent may notice symptoms in the fellow eye within days if the condition is untreated. Other symptoms include:

- A new severe headache
- Tenderness of scalp and temple (combing hair may be painful)
- Weight and appetite loss
- Double vision
- Sore neck
- Jaw soreness, especially when chewing food

Figure 2



Blood tests are important in the diagnosis of temporal arteritis and include an erythrocyte (red blood cell) sedimentation rate (ESR). An abnormally high ESR is indicative of active inflammation.

A biopsy of the temporal artery is usually required to make a definitive diagnosis. Under local anesthesia, a small section of the temporal artery is removed and examined under magnification for inflammatory cells.

The ophthalmologist often works in conjunction with the patient's internist to treat this disease, as both the disease and its treatment are fraught with difficulties. The primary treatment is a high dose of long-term steroids. Oral steroids (such as prednisone) are the only proven therapy to reduce the inflammatory process and to prevent further vision loss, as we pull out all the stops to preserve and protect the remaining visual function of each and every patient.

Floaters, Flashes and Retinal Detachment

As we get older, many of us start to notice new specks and spots in our vision that seem to float and drift, especially with eye movement. They may appear as circles or even cobwebs. Although they rarely interfere with visual function, they can be quite annoying. They are most noticeable against uniform backgrounds, such as a computer screen, a blank page or even the sky on clear days. Ophthalmologists refer to these specks and spots as floaters. They are the products of natural aging changes within the vitreous humor, a clear gel-like substance within the main cavity of the eyeball.

When we are born, the vitreous humor exists as a solid, crystal-clear gel. As we age, the gel breaks down with pockets of liquefied vitreous forming within the gel. As the eye moves, these liquid pockets move independently within the gel. Eventually, the combination of liquefaction and movement creates microscopic cellular debris within the vitreous that appears as floaters.

In the majority of cases, floaters and vitreous movement does not cause damage to the eye, but in some cases this vitreous movement can be strong enough to create a tear in the retina. The retina is a complex array of special nerve receptors that line the inner wall of the eye and transmit images into the brain through the optic nerve, so that we can see. If

the retina becomes torn, vitreous fluid can travel underneath the retina through the tear, dislodging and detaching the retina from its normal position flush against the eyewall. This condition can result in permanent vision loss if left untreated. Because of this, we recommend that anyone experiencing new floaters be examined promptly to make sure no retinal tears are present. This holds true especially if the floaters are also accompanied by bright flashes of light, which tend to occur when the retina is being tugged on or torn by vitreous movement and traction. If tears are identified early, they may be treated in the office with laser therapy. If tears go on to detach the retina, then surgical repair of the retinal detachment in the operating room is required.

Glaucoma

Glaucoma is a condition that affects millions of Americans and occurs with increasing frequency in the older population. But did you know that not all glaucoma is the same? When a person says that he or she has been diagnosed with glaucoma, that person may have been diagnosed with one of a wide range of similar conditions, some of which require very different types of treatments.

The two biggest categories of glaucoma are open-angle glaucoma and closed-angle glaucoma. While open-angle glaucoma, the more common type, is usually treated initially with eyedrops or with laser, closed-angle glaucoma typically requires a laser treatment as initial treatment (Figure 3). Without this laser, the drainage channels in the eye remain closed and other treatments are ineffective. Cataract surgery achieves the same goal as the laser for closed-angle glaucoma, but not all eyes with closed-angle glaucoma are ready to have their cataract removed.

Another distinction is between high-pressure glaucoma and normal-pressure glaucoma. Normal-pressure glaucoma, also known as low-tension glaucoma, is

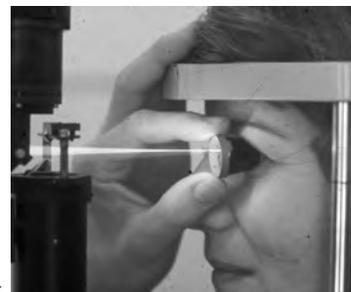


Figure 3

The Aging Eye

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almost identical to its high-pressure counterpart, however the disease occurs at pressures that would usually be considered in the normal range, 10-21 millimeters of mercury. One reason for this may be that eyes with thin corneas measure deceptively low pressures, and allowance must be made for this. But this is not the whole story. Why some patients develop glaucoma with pressures in the normal range is unclear at this time, but the treatment is the same—lower the eye pressure with eyedrops, laser treatment or other surgical intervention.

The Aging Eyelid

First the bad news. As we age, our eyelids go through a variety of changes. Chronic sun damage leads to wrinkles, discoloration, and even skin cancers and other eyelid lesions. Loss of tissue elasticity, combined with the effects of gravity, may lead to droopy upper lids, a condition we call ptosis. Excess upper eyelid skin, a related condition, is called dermatochalasis.

Loss of elasticity may also lead to out-turning of the lower eyelids, a condition we call ectropion (Figure 4). When laxity is combined with spasm of the eyelid muscle (the orbicularis oculi muscle), the eyelid may roll inward, a condition we call entropion. This may cause the patient to have the feeling that something is always scratching the eyes.

Now—the good news. All of these conditions are correctable. Droopy upper lids (ptosis) and excess eyelid skin (dermatochalasis) are treated with a variety of procedures. In ptosis repair, the eyelid muscle needs to be tightened to lift the lid. This may be done either from the inside with no visible stitches or from the outside of the eyelid.

Excess eyelid skin (Figure 4) and fat of the upper and lower lids may be treated with a blepharoplasty procedure. Blepharoplasties may be performed with a variety of instruments, including an “electrical scalpel” or laser.

Tightening the eyelid, through a small incision (less than 1/2 inch) at the outer corner of the eye, repairs ectropion of the eyelid. Entropion repairs require a few more steps, but again they are performed through a small lateral incision. Eyelid lesions need to be evaluated for the risk of cancer, then excised or biopsied based on exam findings.

Non-cancerous lesions may be treated with the erbium or carbon dioxide laser. These and other lasers may also be used to treat a variety of skin-aging changes to the face including wrinkles, brown spots, spider veins and unwanted hair growth. Many of these procedures can be performed right in the office, although some patients opt for the operating room if sedation is preferred.



Figure 4



The Art of Giving

Everyone knows that a quality institution, such as the Krieger Eye Institute, could never subsist on patient fees, alone. The cost of patient care has skyrocketed because of the escalating costs of new computerized instruments, new lasers for treating eye diseases, and the rapid turnover of instrumentation as newer and more effective models are designed. The only way we can provide needed patient care is through the very generous contributions of some very dedicated people.

Indigent Care

There are more people requiring subsidized care than ever before. These include patients in the community who have lost jobs or simply do not earn enough to cover their expenses. There is also the recent influx of Russian immigrants, many of whom have not yet become self-sufficient and for whom we provide care at no cost. This tremendous expense would have strained the capabilities of the Department of Ophthalmology had it not been for the wonderful support of **Joseph and Shirley Kaufman**. Mr. Kaufman is a lawyer with the firm, Schulman and Kaufman. For the past several years **Mr. and Mrs. Kaufman** have provided a generous contribution to the Kaufman Indigent Care Fund to subsidize the cost of medical and surgical care of needy patients.

Retinopathy of Prematurity (ROP)

Retinopathy of prematurity (ROP) is a major cause of blindness in infants and is most commonly seen in babies born prematurely with low birth weight. Immature blood vessels grow into the baby's eyes, predisposing the eye to bleeding, scarring of the retina, and, ultimately, to retinal detachment with irreversible blindness.

Fortunately, the majority of cases of ROP can be completely arrested with laser treatment before progression to blindness. All infants at Sinai are screened

and monitored in the Neonatal Intensive Care Unit. If any baby develops signs of ROP with a threat to sight, then laser is delivered to the retina immediately. The beauty of the laser is that it can be done quickly without the need to travel to a separate operating room and without any surgical incisions.

The department is indebted to **Mr. and Mrs. Willard Hackerman** and **The Macht Philanthropic Fund** for providing sufficient funds to purchase this laser. **Mr. and Mrs. Hackerman** have for many years supported health and education at Sinai Hospital and at The Johns Hopkins University and Hospital. They most recently dedicated the Hackerman-Patz House at Sinai to provide a temporary home for families of patients undergoing long-term surgical and cancer treatment.

Ophthalmic Computerized Tomography

Optical Coherence Tomography, or OCT, is a revolutionary new imaging tool first developed in the mid-1990's. This instrument provides the ophthalmologist with a completely painless, non-contact, non-invasive means of looking at the anatomy of the human retina at a resolution well beyond the capacity of conventional technology. It is capable of producing a detailed cross-sectional view of the human retina at a resolution of one one-hundredth of a millimeter. It allows the ophthalmologist to rapidly detect subtle changes in patients with macular degeneration, diabetes, ocular inflammation and retinal detachment with greater accuracy and sensitivity than with conventional equipment.

The OCT also has the ability to reliably measure the thickness of the retina from visit to visit, ensuring a much more accurate and objective follow-up of macular conditions after laser treatment and intra-ocular injections. Finally, the OCT is capable of producing a high resolution printed image that can be physically shown to the patient to help him or her better understand the disease and response to treatment.

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Do you know?

The retina works more like a computer than a camera.

The retina has 130 million cones and rods that send electrical signals to more than a million neurons in the optic nerve.

There are roughly 1.2 million fibers in the optic nerve, each connected to a neuron.

Neurons can "fire" up to 200 pulses per second.

One eye can send up to 200 megabits (that's 200 million) per second to the brain for processing into what you see. And it happens in "real time."

Sept. 29, 2003, New Yorker Magazine

Careless use of eye makeup and hair dye can cause eye damage and even loss of sight.

Hair dye, used at home by thousands of women, can cause serious eye damage and blindness if used incorrectly. Warnings against the potential lethality of these products are stated on the packages.

In 2001 alone, there were more than 4,000 eye injuries caused by hair products.

Cosmetics can also lead to eye infections and irritations. They should be kept away from excessive heat and cold that could break down the preservatives, allowing bacteria to grow.

Preservative-free cosmetics can be dangerous because bacteria may thrive in these products.

To reduce the chance of allergic reaction, use cosmetics labeled "fragrance-free," "hypo-allergenic" or "for sensitive skin" and remove makeup every night.

Glaucoma tends to run in families

Studies have shown that 20 to 30 percent of siblings of someone with glaucoma also have the disease.

If someone in your immediate family has glaucoma, you should have your eyes examined through dilated pupils at least every two years.

Glaucoma is three to four times more likely to occur in African-Americans than in Caucasians.

It is six times more likely to cause blindness in African-Americans than in Caucasians.

Everyone with a family history of glaucoma and all African-Americans should be examined every three to five years between ages 20 and 39; every two to four years between ages 40 and 64; and every year after age 65.

What are antioxidants and where are they found?

Oxygen is essential for life, but can create damaging free radicals that interfere with normal cellular metabolism. Antioxidants bind to free radicals before they can cause damage. If left unchecked, free radicals may cause heart damage, cancer, cataracts and a weak immune system.

Antioxidants come in a variety of forms and include vitamin C, vitamin E, the carotenoids, and selenium and can be found in many fruits and vegetables, including the following: green leafy vegetables (vitamin E, lutein, zeaxanthin), broccoli (vitamins A and C, lutein, zeaxanthin), berries and tomatoes (vitamin C), carrots and sweet potatoes (vitamin A), and cantaloupe (vitamins A and C).

When the sunlight bothers your eyes

Sunglasses can protect your eyes from the sun's ultraviolet (UV) light.

The darkness of the lens has nothing to do with UV protection. Choose glasses that block out at least 99 percent of UV light.

Wraparound sunglasses can keep light from getting into your eyes from the side.

Polarized lenses can cut the glare when light bounces off smooth surfaces such as water or pavement.

Diabetes and Blindness

Approximately four million persons age 40 and older in the United States have diabetic retinopathy.

Diabetic retinopathy, a complication of diabetes mellitus (DM), is a leading cause of blindness in the United States. It is characterized by hemorrhages and microaneurysms in the retina, which is located in the back of the eye. This retinopathy occurs in most persons with longstanding DM.

Diabetic retinopathy affects two out of five of persons who have DM and are 40 years and older.

Unlike other age-related diseases, diabetic retinopathy often causes blindness in young workers.

Vision loss from diabetic retinopathy can be prevented by a proper diet, medications and laser treatment.

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NOTICES AND HAPPENINGS

Dr. James Karesh, Dr. Marc Hirschbein and Dr. Iftach Yassur have two chapters that were published in the textbook *Step by Step Oculoplastic Surgery*. The book was edited by A. Agarwal and published by Jaypee Brothers of New Delhi, India.

Dr. Marc Hirschbein presented a lecture at LifeBridge Health last month where he discussed endoscopic brow and forehead surgery, Botox injections, laser micropeels, laser hair removal, laser vein treatment and non-ablative laser rejuvenation.

Dr. Tony Castelbuono and Dr. Irvin Pollack will be attending the annual meeting of the American Glaucoma Society in Utah. This is the largest glaucoma meeting for glaucoma specialists in the country and provides the opportunity to present and hear about the latest glaucoma research being conducted.



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The Krieger Eye Institute is grateful to **Richard and Natalie Nelson** who made the purchase of this very important laser possible. **Mr. and Mrs. Nelson** have a long history of philanthropy for health care and are very good friends of the Krieger Eye Institute at Sinai. Mr. Nelson was president of Fish Rental Service and for many years he served with Riggs, Conselman, Michaels and Downes.

Summary

Without a doubt, there is an art to giving. It is not determined by how much one wants to contribute because any amount, large or small, is important to sustain the important work of the department. More important is the need to determine which of the many projects the donor wishes to support. Some projects have been listed above. Other important areas include the need for research support, for training Ophthalmology residents and to support community outreach programs. For further information, please call Dr. Irvin Pollack at 410-601-9084 or write to Irvin Pollack, M.D., Krieger Eye Institute, 2411 W. Belvedere Ave., Baltimore, Maryland 21215-5271. Checks should be made payable to the Krieger Eye Institute and mailed to Irvin Pollack, M.D., at the above address.

The Krieger Eye Institute welcomes Gerami Seitzman, M.D.

Dr. Seitzman, a specialist in corneal, cataract and anterior segment surgery, has joined the KEI faculty. Dr. Seitzman graduated summa cum laude and went on to receive her medical degree from the University of Michigan in Ann Arbor. She then served a residency in ophthalmology at the Wilmer Eye Institute in Baltimore. She served a fellowship, specializing in cornea and external disease, uveitis, and refractive surgery, at the Proctor Foundation at the University of California in San Francisco. She has received several awards including Outstanding Resident of the Year, Outstanding Humanistic Qualities of

Compassion, and was commencement speaker at the University of Michigan Medical School.

Dr. Seitzman serves on the anterior segment service where she will not only be seeing patients, but will also be teaching medical students as well as residents who rotate through the KEI as part of the joint Wilmer-Sinai-GBMC program. Her research interests include diseases of the cornea, genetic studies of the cornea and surgical techniques of cataract surgery in patients with corneal disease. Dr. Seitzman is also on the teaching staff at the Wilmer Eye Institute and is assistant professor

(part-time) in Ophthalmology at the Johns Hopkins University.



Dr. Seitzman is a delightful person with a smiling personality. She and her husband, Dr. Elliott Margulies, share interests in music and theater. Her husband is a scientist at the National Institutes of Health.

The entire faculty and staff of the Krieger Eye Institute welcome Dr. Seitzman to Sinai and wish her well in her new position.



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