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- Adult Eye Cataracts

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Eye Care Newsletter

Omni Eye Specialists · Madison Street Surgery Center
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DRY EYE

Howard Amiel, M.D

One of the few potential downsides of living in the beautiful state of Colorado

Dry eye is an extremely common condition, particularly in the semi-arid climate of Colorado, and a common chief complaint of patients presenting to our clinic. The symptoms of dry eye range from mild ocular irritation or a sensation of the eyelids feeling heavy, to severe ocular foreign body sensation, blurry vision, and debilitating discomfort. If left untreated, the long term sequelae of dry eye leads to the breakdown of the ocular surface resulting in the potential for corneal scarring, conjunctival inflammation, compromised vision, and ocular pain.

How to classify dry eye

The etiology of dry eye can be broken down into hyposecretory dry eye, or an issue with the quantity of tear production, versus evaporative dry eye, which is an issue of the quality of tear production. Hyposecretory dry eye is most commonly related to autoimmune conditions such as rheumatoid arthritis and thyroid disease, but may also be iatrogenic as a result of common systemic medications or prior ocular surgery. Furthermore, constitutional factors such as female gender and age over 50 also predispose to dry eye. Evaporative dry eye is often related to subtle, treatable inflammatory changes of the lids, or environmental factors related to ceiling fan use, air conditioning during the summer months, or airplane travel, among other things. It typically results from a compromise in the lipid layer of the tear film.

The diagnosis and treatment of dry eye

The diagnosis of dry eye is fairly easy to determine, with the adequacy of tear production and quality of the tear film accessed through a simple office visit with minimal testing.

The treatment of dry eye is addressed in a step-wise fashion. Any issues related to the function of the lids are treated and any evidence of inflammation can then be managed as well. We typically recommend lubricating drops with frequent instillation, as often as hourly, and a gel or ointment preparation before bed. Placing a silicone or collagen plug in the punctum, or tear drainage duct of the eyelid, allows for more moisture on the ocular surface. Restasis®, or topical dilute cyclosporine, is an excellent agent which works well in a subset of patients, although the benefits of this medication may take months to realize. In addition, there is evidence supporting the efficacy of flax seed and omega fatty acid supplementation.

A novel treatment for dry eye

Many studies over the past 25 years have demonstrated the effectiveness of dilute autologous blood serum formulated as an eye drop, and this therapy is more commonly used in Japan, Australia, and the UK. The pH and osmolality of human serum are very similar to basal tear secretion and have proven to be an excellent surrogate for patients who lack adequate tear production. Furthermore, human serum contains many important biologically active proteins, growth factors, fibronectin, and nutrients that have proven essential for epithelial and goblet cells, the predominant functional cells of the ocular surface. This treatment is offered to patients through our office.

Relief from dry eye

In summary, dry eye is a very common clinical entity, particularly in this region of the country. It can cause a significant degree of discomfort and visual impairment, and if left untreated my cause long term damage to the ocular surface. We have many excellent therapeutic options to offer our patients, alleviating their discomfort, pain, and compromised vision.

CATARACT IN THE ADULT EYE

Jason Wang, M.D.

(from the Preferred Practice Patterns Cataract Module, American Academy of Ophthalmology, January 2008)

Cataracts are the leading cause of blindness worldwide and remain an important cause of blindness and visual impairment in the United States, accounting for approximately 50% of low-vision cases in adults over the age of 40. Cataracts are the leading cause of treatable blindness among Americans of African descent age 40 and older and are the leading cause of low vision among Americans of African, Hispanic/Latino, and European descent. The Eye Diseases Prevalence Research Group estimated that the number of individuals with cataracts will increase by 50% by 2020, based on United States (US) Census population estimates.

Rate of Cataract Surgery in the United States

In 2004, a total of 1.8 million cataract procedures were performed on Medicare beneficiaries who were not enrolled in health maintenance organizations. In 2004, the national average surgeon reimbursement was $684.39 for a national total of $1.2 billion. Other associated costs are facility fees, including intraocular lens (IOL) implant costs, and anesthesia services. Cataract surgery with IOL implantation was the most frequently performed operation and the single largest expenditure for any Part B procedure in the Medicare program, calculated by Part B procedure codes based on allowed charges.

The utilization of cataract surgery in the United States has been found to be appropriate for the majority of cases studied. A study at ten academic medical centers found that 2% of cataract surgeries performed were classified as inappropriate based on available records. An inappropriate rating meant that the risks of surgery were deemed to exceed the potential benefits as rated by a panel. The percentage deemed inappropriate in this study correlates to earlier estimates of 2.5% by the 1993 US General Accounting Office and a rate of 1.7% by the US Inspector General. Cataract appropriateness ratings are comparable to the rate found for coronary artery bypass graft surgery (2.4% inappropriate) and lower than the rate for carotid endarterectomies (10.6% inappropriate). The criteria for appropriateness of cataract surgery were based on indicators of visual acuity and functional impairment, such as difficulty driving, reading, and other activities of daily living. The study did note that the information that was recorded varied, particularly on functional impairment, and increased attention to documenting specific functional impairments is appropriate. A study of Medicare beneficiaries in 13 large areas in the United States found that cataract surgery ranked among procedures with the least variation in use. Also, second opinion programs implemented for cataract surgery have not succeeded because initial recommendations for surgery were found to be appropriate.

Visual Function and Quality of Life

The multiple components of visual function include central near, intermediate, and distance visual acuity; peripheral vision; visual search; binocular vision; depth perception; contrast sensitivity; perception of color; adaptation; and visual processing speed. Visual function also can be measured in terms of functional disability caused by visual impairment. Many activities are affected by more than one of these visual components.

Function and quality of life are the outcomes of treatment that are most critical and applicable to the patient. In well-designed observational studies, cataract surgery consistently has been shown to have a significant impact on vision-dependent function; up to 90% of patients undergoing first-eye cataract surgery note improvement in functional status and satisfaction with vision. Several studies have reported an association between improved visual function after cataract surgery and an improved health-related quality of life. Visual function plays an important role in physical function and well-being, particularly in terms of mobility. The loss of visual function in the elderly is associated with a decline in physical and mental functioning as well as in independence in activities of daily living, including night-time driving, daytime driving, community activities, and home activities.

Visual impairment is an important risk factor for falls and for hip fracture; poor depth perception and decreased contrast sensitivity has been found to increase independently the risk of hip fracture. In a randomized controlled trial, first-eye cataract surgery was found to reduce the rate of falling and fracture over a 12-month period. Visual impairment, in particular a decrease of visual acuity and contrast sensitivity, has been shown to be associated with difficulties in driving. Drivers with visually significant cataracts were 2.5 times more likely to have had an at-fault involvement in a motor vehicle crash over a 5-year period compared with drivers without cataracts. When older adults with cataracts who have undergone surgery are compared with those who did not undergo surgery, motor vehicle crash rates in the 4 to 6 years of follow-up were halved in the surgery group.

The quality-adjusted life year (QALY) is a generic outcome measure that was developed to compare the cost-utility of different health care interventions. A lower dollar cost per QALY indicates a better value. Using Swedish registry data, the hypothetical cost per QALY gained (calculated in 2002) for cataract extraction in one eye was estimated at US $4,500. Studies in the United States found that the cost per QALY gained for cataract extraction in the first eye was $2,023 (calculated in 2002) and in the second eye was US $2,727 (calculated in 2003). The value of cataract surgery compares favorably with that reported for other ophthalmic (e.g., laser photocoagulation for diabetic macular edema, $3,101; laser photocoagulation for extrafoveal choroidal neovascularization, $23,640) and non-ophthalmic procedures (e.g., single-vessel coronary artery bypass surgery for disease of the left anterior descending artery costs $7,000/QALY) and demonstrate the value of cataract surgery.

Physical function, emotional well-being, safety, and overall quality of life can be enhanced when visual function is restored by cataract extraction.

Improved visual function as a result of cataract surgery includes the following:

- Better optically corrected vision.
- Better uncorrected vision with reduced spectacle dependence.
- Increased ability to read or do near work.
- Reduced glare.

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GENETICS OF MACULAR DEGENERATION **Miriah Teeter M.D.**

Age-related macular degeneration (AMD) continues to be the most common cause of vision loss among the elderly. The prevalence will also continue to rise with the demographic shift of our aging population. Understanding of the pathophysiology and genetics of AMD has grown dramatically in recent years. A number of specific genes have been established as major risk factors in the development and progression of AMD. Genetic polymorphisms among complement factors account for the majority. Analysis of these genetic variants, along with age and smoking history, has yielded highly predictive models of individual patient risk. These advances allow greater prognostic accuracy and will help tailor treatment and monitoring for individual patients.

The impact of these advances will be compounded by the advent of new treatments for macular degeneration. A new generation of AMD treatments is currently in development, with clinical availability expected within the next one to two years. Many of the investigational studies are collecting genetic data of participants and will provide correlation of treatment outcomes with specific genetic markers. Looking ahead to a time in which we have multiple treatment options for AMD, we may be able to select the most appropriate treatment for an individual based in their genetic traits.

A non-invasive, cost effective genetic test is now available in the retina clinic for patients with AMD and their families. Risk factor management and monitoring may be advised for family members that carry increased risk of AMD development. Closer monitoring and more aggressive treatment protocols will be utilized for AMD patients with increased risk of AMD progression. We are now able to offer patients greater insight into their condition and are entering an era of increasingly individualized treatment of retinal disease.

CATARACT IN THE ADULT EYE
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- Improved ability to function in dim levels of light.
- Improved depth perception and binocular vision.

Improved color vision.
Improved physical function as a critical outcome of cataract surgery includes the following:

- Increased ability to perform activities of daily living.
- Increased opportunity to continue or resume an occupation.

Increased mobility (walking, driving).
Improved mental health and emotional well-being as a second critical outcome of cataract surgery includes the following benefits:

- Improved self-esteem and independence.
- Increased ability to avoid injury.

Increased social contact and ability to participate in social activities.

At OMNI Eye Specialists, cataract surgery consultations are provided such that the individual needs of the patient are assessed and addressed during a thorough preoperative session. Traditional and premium multifocal and accommodative lens options are discussed and surgical options are tailored to the patient's particular visual preferences. The on-site single-specialty cataract surgical facility provides efficient and customer-oriented service in a cost-effective manner. Ancillary ophthalmic services that are determined to be needed are available and provided by fellowship-trained, Board certified vitreo-retinal, glaucoma, oculoplastics, cornea, and LASIK-Refractive surgery specialists who are regarded to be at the forefront of their respective fields.

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