

# Cataracts research paper



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Nahshon Brown 11/16/11 Human Anatomy 5th Period Cataracts What is Cataracts if you may ask? A cataract is an eye disease in which the natural lens of the eye gradually degrades the visual quality. The natural lens sits behind the colorful part of the eye known as the iris in the area known as the pupil, which cannot be seen unless it becomes very cloudy. This is crucial, because the lens plays a significant role in focusing a light on the retina at the back of the eye.

The retina turns light into a neurologic signal that the brains takes and then interprets it to be vision. What cataracts do is block the light passing through the lens therefore causing visual symptoms and complaints. Where did the term cataracts derive from? Cataracts derived from the Greek term cataractos, which describes rapidly running water. To show the connection between the two terms, when water is turbulent it is transformed from a clear medium to white and cloudy. What are the causes of cataracts? The lens has a makeup of mostly water and protein.

Some of the proteins are responsible for maintaining the clarity of the lens but over the years the structure of the proteins in the lens are altered, which leads to the gradual clouding of the eyes; Cataracts can be present at birth or even in early childhood but it's very rare. Severe trauma to the eye and even eye surgery can also cause cataracts to occur early. Other factors that could lead to cataracts at an early age would be excessive ultraviolet exposure, diabetes, smoking or the use of medications such as oral, topical or inhaled steroids.

Cataracts can occur in one or both of the eyes but one eye has to be worse than the other. Cataracts are an eye disease that has been around throughout history. The earliest records are from the bible as well as early Hindu records. In the early days, concoctions and eye drops were produced to treat cataracts. Surgical treatment began by physicians in ancient Babylon and India. The first reference to cataracts and its treatment was in Ancient Rome found in twenty nine AD in “ De Medicinae, which was the work of the Latin encyclopedias Aulis Cornelius Celsus.

The first extraction of Cataracts was performed by Iraqi Ammar ibn of Mosul. The method which is known as couching was when they used a very sharp instrument to push the cloudy lens to the bottom of the eye. Surprisingly, this method is used in some parts of Africa today. An advance In the surgical ways of removing cataracts came in the eighteenth century. Surgeons progressed to make incisions on the eye and remove lens and capsule instead of pushing it backward. Shockingly around this time, even one surgeon tried to replace the cataract with a small glass lens, but it was too heavy and sank to the bottom of the eyes.

The only way patients would be able to see after surgery would be to wear thick, heavy cataract glasses. In the twentieth century, surgeons had discovered to remove the cloudy lens but to leave the empty capsule in the eye. Discoveries were made during World War II. British surgeons found out that pieces of Plexiglas from shattered canopies of fighter planes did not cause a harmful reaction in a pilot’s eyes. Discovering this, British surgeon Harold Ridley designed a tiny lens that was to be implanted in the eye.

Charles Kelman, an American Surgeon, adapted a new technology called ultrasound to remove cataracts in the of nineteen sixty eight.

This procedure known as phacoemulsification, uses a small probe with a vibrating tip to gently break up cataracts and wash it away. This revolutionary technology changed the way cataracts surgery was performed when ultrasound and plastic lens technology was performed. Modern cataract surgery is considered to be one of the safest surgeries performed with millions of procedures completed every year around the world. There is many different types of cataracts. There is the age related cataracts. There is also secondary cataracts, traumatic cataracts, congenital cataracts and radiation cataracts.

Secondary cataracts can be formed by if for example an eye was recently worked on for different eye issues and diseases. Traumatic cataracts occur when a year after an event occurs and the eye is damaged cataracts develops. It can occur from blunt trauma to the eye or from exposure of the eye to alkaline chemicals. A congenital cataract is when a child is born with cataracts. Depending on the genes, the inherited condition may be insignificant enough to the point where it does interfere with vision. If the child's vision is disturbed the lens of the eye will be replaced with synthetic lens.

Congenital cataracts can also occur from specific illnesses or infections that the mother has during pregnancy. Disorders such as Rubella and galactosemic increases the chances that your child will acquire congenital cataracts. The last form of cataracts is radiation cataracts. This form of

cataracts is caused by an over exposure to ultraviolet sunlight and other forms of radiation. Exposure to sunlight in a prolonged period of time doubles the risk of obtaining radiation cataracts. An interesting point I found was that cataracts cannot spread from one eye to the other.

The best way to prevent or try to prevent cataracts from occurring is by doing and cutting back on many different things. Because cataracts is not completely preventable, you can at least delay its occurrence. You can try to quit smoking, avoiding over exposure to sunlight, and avoid drinking excess amounts of alcohol. Also eating many fresh fruits and vegetables may delay the formation of cataracts. No evidence show that using eye drops or ointments or performing eye exercises will stem the onset of cataracts. One of the many ways to try and prevent the development of cataracts is by avoiding ultraviolet radiation.

The simplest way to avoid ultraviolet radiation is by staying out of the sun. Make sure to cover up especially when the sun is most intense around ten a. m. to three p. m. A very wide hat can especially reduce eye exposure to UVB radiation. The sun's rays are so reflective to the point where sitting under an umbrella or in the shade does not guarantee protection. Sunglasses can be very effective and do not have to be expensive. Make sure the sunglasses state that they block ninety nine percent of UVB rays and ninety five percent of UVA rays.

Polarized and mirror coated lenses are not an option because they do not offer any protection against UV Radiation. It is not clear if nutrition plays a significant role in cataracts development. Eating dark colored fruits and

vegetables have high levels of important plant chemicals and could be associated with a lower risk for cataracts. Researchers have analyzed nutrients and have focused on antioxidants and carotenoids. The studies that have been done have not demonstrated that antioxidant vitamin supplements( for example vitamins C and E) help prevent cataracts.

Lutein and zeaxanthin, which are two carotenoids, have been studied to prevent cataracts. They are xanthophylyes compounds, which are a particular types of carotenoid. These two carotenoids are found in the lenses of the eyes. Some research has proven that eating dark leafy green vegetables may help slow down the aging process in the eye and therefore protect against cataracts. However, not enough evidence has been proven to show that taking supplements of these carotenoid would lower the risk of cataract formation. Aging is a primary risk factor for cataracts, but many other factors are involved.

Nearly everyone who lives long enough will develop cataracts to some extent. Women for some reason have a higher risk than men in obtaining cataracts. Cataracts also tends to run in many families. Studies have also shown that African Americans seem to have twice the risk of developing cataracts than Caucasians do. The reason for this may be due to diabetes that runs more prevalent in African Americans. African Americans are also even more prone to becoming blind from cataracts and glaucoma than Caucasians, mostly due to a lack of treatment. Hispanic Americans by far have the most risk for obtaining cataracts.

Here is a few interesting statistics on cataracts. Cataracts accounts for a majority of vision lost around the world. Acquired cataracts accounts for over ninety nine percent of all cataracts. In the continent of Australia cataracts surgery is the most commonly performed eye procedure. The prevalence of cortical cataracts in urban Australian population is eleven point three percent. The people aged fifty through to fifty nine years increase by four percent in terms of the number of people affected. In the United States cataracts affects nearly twenty point five million American from the ages of forty and older.

By age eighty, more than half of all Americans have cataracts. These statistics are staggeringly high and prove how common cataracts is in our society. The National Eye Institute took a survey and here are some of the statistics from the year two thousand and ten. Between the ages forty and forty nine two point five percent of the population has cataracts. Between the ages of fifty and fifty nine six point eight percent of the population have cataracts. Between the ages sixty to sixty nine twenty percent of the population have cataracts.

Between the ages of eighty and above sixty eight percent of the population have cataracts. By the year 2020, the number of people affected by cataracts is expected to jump to 30 million Another risk factor could be diabetes and many other medical conditions. Many people who have medical conditions such as diabetes are at high risk for cataracts. The reasons could be a direct result of the disease, the treatments, or both. For people who have been diagnosed with type one or type two diabetes they are extremely

prone to obtaining cataracts and they have a much greater chance of developing it at a younger age.

There is also a higher risk for nuclear cataracts than non diabetics. Since cataracts development is significantly related to very high levels of blood sugar, people with diabetes are sometimes referred to as sugar cataracts. Medical conditions in which people use steroids is taking a very high risk. Also, people who are nearsighted have increased chances of developing cataracts. Even physical blow to the eyes such as hard blows, cuts, puncture, and eye inflammation can increase risk. Previous surgery done to the eyes and even obesity can increase the risk of developing cataracts.

Exposure to low level sunlight even increases the risk of developing cataracts, especially nuclear cataracts. The risk is highest for those who had the most exposure to the sun at a very young age. Of course people who have jobs that require them to work outside for long periods of time are at an increased risk of developing cataracts. Smoking a pack of cigarettes every single day could double the risk of developing cataracts. Smokers are putting themselves in a more severe situation where smoking can cause a more severe form of cataracts in the nuclear portion of the lens, which limits vision more severely than cataracts in other sites.

Last but not least, alcohol drinkers leave themselves open for a number of eye disorders, including cataracts. The prognosis on cataracts is very interesting in many different ways. Cataracts depending on the severity of it and what type it is can stop at a certain point. Cataracts is never reversible, even if you decided to cut off the factors which lead to the development of



cataracts. Surgery is available to remove cataracts but unfortunately it is not available in every part of the world. In order to be examined you must either see an ophthalmologist or an optometrist.

Only ophthalmologist are allowed to treat cataracts. Eye professionals can see the cloudy areas of the lens by a direct physical examination, even before cataracts begins to flirt with your vision. Various vision tests can also be performed. One of the tests is known as the Snellen Eye Chart. This chart is used to see how clearly a person can actually see. The Snellen Eye Chart consists of a row of letters decreasing in size. The way the test is done is the person stands at a distance about twenty feet away and they read the letters one eye at a time.

If the person reads every letter correctly down the line to twenty feet that individual's vision is twenty twenty vision. If the person can only read through the line marked forty feet, then their vision is twenty forty. If the large letters on the line cannot even be read even with the better eye that person is considered legally blind. Treatment for cataracts is of course the only way to fix cataracts but it is certainly not an emergency. Only harm cataracts causes is a reduced ability for that individual to see. Therefore, there is nothing wrong in delaying surgery. Early cataracts can be handled in a less severe manner instead of surgery.

The individual get stronger glasses or contact lenses, use a magnifying glass for reading, use stronger lighting, or they can use medication to dilate the pupil. The progression of cataracts is not fast so families and patients have plenty of time to figure out how they want to attack the problem with the

ophthalmologist. Rarely do people ever need cataract surgery immediately. Cataracts surgery is one of the most common types of eye surgery's performed in the United States, especially for seniors. Back in the day, cataracts surgery was not performed until cataracts had become well developed in the individual.

However, newer techniques have been discovered and have now made safer and also more efficient for surgery to be done in the early stages of cataracts. Cataracts surgery has been proven to improve vision by ninety five percent and could prevent millions of Americans as well as the rest of the world from going blind. The decision for cataracts surgery to be performed is really based on that individuals own perception and there vision difficulties. The patient is of course made aware of all the risks and cost of the surgery. There is a few indications for whether or not surgery should be performed.

That is determined by how someone does on the snellen eye test and if the vision loss is so bad to the point where glasses cannot fix the problem. When the person is having such a difficult time performing everyday tasks to the point where there independence has become threatened. If the criteria for surgery is met, a older person may have less need to have sharp vision than a younger person. Elderly patients at the ages of eighty five and up that have serious health issues have a higher risk of complications if surgery were to be performed as well as a worse outcome after the surgery is performed.

These stats should not stop older individuals from having surgery as vision will still improve by eighty five percent. Even if someone who has not met

the requirements for the surgery may still want to get it done because of problems with glare, double vision, or the need to have an unrestricted driver's license. If criteria for cataracts surgery isn't met, cataracts surgery may be performed if the patient has a retinal disease and cataracts surgery would allow for a clear view of the eye. Because of the small risks of obtaining poorer vision or blindness no one should be forced to have the surgery if they don't want to or are not forced to.

If someone has cataracts in the second eye, the decision making should be the same as the first eye. However, the timing for doing the procedure with cataracts in both eyes is very unclear. The recommendation for this situation has been that the patient allow the first eye to heal before performing surgery on the second eye. Unfortunately, many patients have trouble reading as well as performing ordinary tasks while waiting to have cataracts surgery on the other eye. Patients who have double cataracts should discuss there situation with their surgeon.

Cataracts surgery is done usually as an outpatient procedure under anesthesia and takes less than an hour to perform. Preoperative operations may include many things. First of all, having a general physical examination is very key especially for people who have diabetes. Its extremely important because diabetes can cause damage to the blood vessels of the retina, a condition known as retinopathy. Studies have shown that people who have retinopathy and poor blood sugar control should not have there sugar corrected before cataract surgery is performed. Doing this may cause vision problems after the surgery has been performed.

The ophthalmologist will use a painless ultrasound test that will measure the length of the eye as well as determine the type of replacement lens that will be needed after operation. Topical antibiotics is applied pre operatively to protect against post operative infections. If the patient is healthy they will receive either a local injection or a topical anesthetic. They may even receive a sedative or the general anesthesia. Every cataracts surgery performed always involves the removal of the cataract affected lens and replacing it with artificial lens. Phacoemulsification is the most common procedure done in the United States of America.

First of all, the surgeon will begin to make a small incision in the eye. A very small probe is used to break up the clouded lens into very small pieces.

Next, the small pieces of lens are sucked out by a vacuum like device. Then the replacement lens is then inserted into a capsular bag where the natural lens used to be at and is then folded and put into that small incision. The phacoemulsification method requires only anesthesia. Most of these phacoemulsification procedures should take only fifteen minutes, and the patient is usually out of the operating room after about an hour.

There might be a little discomfort after the procedure and the rehabilitation process takes one to three weeks. The original procedure for cataracts which is known as extra capsular cataract extraction, is now mostly used on patients who have very hard lens. First, the procedure starts by ophthalmologist working under a microscope and then making a small incision in the cornea of the eye. Then the surgeon extracts the clouded lens through the incision. The capsule is then left in the eye to add structural strength and aid in the healing process.

A replacement lens is then inserted. A small suture is then used to put the incision back together. This procedure takes about two to four weeks for vision to be restored. After surgery is complete eyeglasses or lenses are mandatory because the retina cannot focus on a sharp image. Modern cataract surgery is one of the safest of all surgical procedures. However complications can occur even though they won't be too serious. Swelling and inflammation can occur but the risk for that occurring is about 1%. Patients can experience glare after surgery has been performed.

The reason being is because light is scattering at the edges of the new lens, particularly with square edged lens, which are typically used with posterior capsular cataracts. This problem is temporary and is usually resolved after a few weeks. Rarely the issues continue and the patient would need another operation. Materials used to make the lens can trigger an immune response in some patients. This causes inflammation to take place and tiny deposits of tissue in the eye which leads to secondary cataracts, known as posterior capsule opacification. In rare cases, the retina at the rear of the eye even become detached.

The risk of this happening is extremely low and phacoemulsification poses less of a risk for this than the older standards for cataracts surgery. It can lead to Atonia also which is the loss of muscle tone which results in a disturbing glare. Last but not least, glaucoma is also a possibility after surgery has been done. Glaucoma is an eye condition where the pressure of fluids inside the eye rises to extremely unsafe height. Infections are extremely rare but can be significant if it does develop. It is possible to

receive blisters on the cornea. The risk of rupture is higher with phacoemulsification, but the risk is very low.

Bleeding can develop in the eye and it can either develop a little or a lot. The phacoemulsification procedure has a few specific complications. One of the many complications is rupture of the capsule. Another one can be the loss of the lens nucleus into the eye fluids. The flying of fragments of the lens can damage the cornea or threaten the retina. Extreme changes in blood pressure before the surgery and after the surgery. Last but not least, in thirty percent of most cases patients develop secondary cataracts between one to five years after surgery.

In order to prevent infection and reduce swelling the ophthalmologist may prescribe a few medications after surgery. A topical antibiotic can prevent against infection. A lot of times Corticosteroid or ointments are used to reduce swelling, but can possibly cause increased pressure in the eye. The risk for greater complications are possible for people in the following scenarios. People who have other eye diseases. People who have diabetes have a high risk for developing or worsening retinopathy, a well known eye complication for diabetics.

However, the more experienced the surgeon is the more likely there is a chance the complication will not occur. The postoperative care for an individual who had cataract surgery is pretty good in terms of the speedy recovery time. Patients usually leave the surgical site after an hour of surgery. Patients will need someone to take care of them until their eye site heightens. The patient is examined a day after the surgery and then

during the following month. The vision of the patient usually remain blurry for a good minute and gradually clears, usually taking two to six weeks.

When the doctor sees the condition has stabilized, he or she will then write up the final prescription for glasses or contacts. Patients are usually taught on how to protect there eyes after surgery. The ophthalmologist usually puts a bandage over the eye to protect it and allow it to heal properly. When trying to switch the old bandage with a new one, clean the eye gently with a washcloth dipped in warm water without soap. Next, take a new bandage and tape it on your eye. An eye shield can be placed on the eye at night. There is many symptoms that come with the cataracts disease.

The first symptom is cloudy vision, double vision, or both. Images can take on a yellowish tint when color vibrancy diminishes. Reading can become very difficult because of the reduced contrast between letters and the background. Sensitivity when it comes to bright lights can make it impossible to drive at night. In advances cases, the pupil looks milky or yellowish. That's when the persons vision is only able detect light from dark. The symptoms that show that nuclear cataracts is developing is as follows. One of the signs is hazy distance vision and increasing glare.

Constant change in eye prescription because of increased nearsightedness. As the cataracts gets worse stronger eye glass prescriptions can no longer help the patients vision. The symptoms to show that cortical cataracts has developed is as follows. They have very little effect on the person eyesight. Glare can develop the more the cataracts develops and gets closer to the center of the lens. Problem with contrast sensitivity, distance vision, and

clarity gets worse as cataracts gets worse. Cataracts surgery can cause glaucoma and here is a few ways to deal with the possibility.

One of the steps you can take is minimize vigorous exercise. Put on shoes while sitting and without lifting up the feet. Kneel instead of bend over to pick up something. And last but not least limit reading since it requires eye movement. As stated above, cataracts is a eye disease the is the clouding of the lens in the retina. There has been much information given on how to prevent cataracts, and how to deal with cataracts if you been diagnosed with it. I hope and pray that we take this information to heart and begin to take care of our eyes! [pic] [pic] <http://health.nytimes.com/health/guides/disease/cataract/treatment.html>

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