

Cataracts

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Course Objectives

For the healthcare professional to define cataracts, causes and risk factors, symptoms and detection, various options for treatment and current research trends.

Cataract definition

A cataract is a clouding of the lens in the eye that affects vision. Most cataracts are related to aging. Cataracts are very common in older people. By age 80, more than half of all Americans either have a cataract or have had cataract surgery.

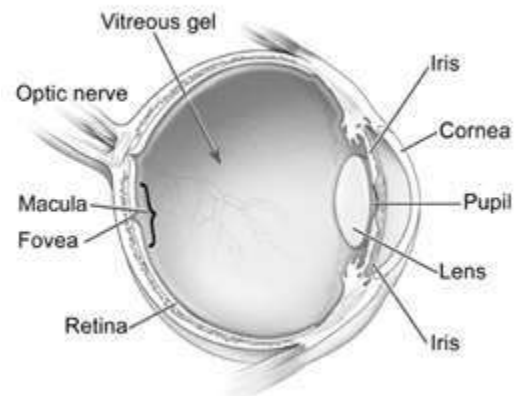
A cataract can occur in either or both eyes. It cannot spread from one eye to the other.

Lens definition

The lens is a clear part of the eye that helps to focus light, or an image, on the retina. The retina is the light-sensitive tissue at the back of the eye.

In a normal eye, light passes through the transparent lens to the retina. Once it reaches the retina, light is changed into nerve signals that are sent to the brain.

The lens must be clear for the retina to receive a sharp image. If the lens is cloudy from a cataract, the image will be blurred.



Types of Cataracts

Although most cataracts are related to aging, there are other types of cataract:

1. **Secondary cataract.** Cataracts can form after surgery for other eye problems, such as glaucoma. Cataracts also can develop in people who have other health problems, such as diabetes. Cataracts are sometimes linked to steroid use.
2. **Traumatic cataract.** Cataracts can develop after an eye injury, sometimes years later.
3. **Congenital cataract.** Some babies are born with cataracts or develop them in childhood, often in both eyes. These cataracts may be so small that they do not affect vision. If they do, the lenses may need to be removed.
4. **Radiation cataract.** Cataracts can develop after exposure to some types of radiation.



Normal vision



The same scene as viewed by a person with cataract

Cause and Risk Factors

The lens lies behind the iris and the pupil. It works much like a camera lens. It focuses light onto the retina at the back of the eye, where an image is recorded.

The lens also adjusts the eye's focus, letting us see things clearly both up close and far away. The lens is made of mostly water and protein. The protein is arranged in a precise way that keeps the lens clear and lets light pass through it.

But as we age, some of the protein may clump together and start to cloud a small area of the lens. This is a cataract. Over time, the cataract may grow larger and cloud more of the lens, making it harder to see.

Researchers suspect that there are several causes of cataract, such as smoking and diabetes. Or, it may be that the protein in the lens just changes from the wear and tear it takes over the years.

Cataracts and Vision

Age-related cataracts can affect vision in two ways:

1. Clumps of protein reduce the sharpness of the image reaching the retina. The lens consists mostly of water and protein. When the protein clumps up, it clouds the lens and reduces the light that reaches the retina. The clouding may become severe enough to cause blurred vision. Most age-related cataracts develop from protein clumpings. When a cataract is small, the cloudiness affects only a small part of the lens. You may not notice any changes in your vision. Cataracts tend to "grow" slowly, so vision gets worse gradually. Over time, the cloudy area in the lens may get larger, and the cataract may increase in size. Seeing may become more difficult. Vision may get duller or blurrier.
2. The clear lens slowly changes to a

yellowish/brownish color, adding a brownish tint to vision. As the clear lens slowly colors with age, the vision gradually may acquire a brownish shade. At first, the amount of tinting may be small and may not cause a vision problem. Over time, increased tinting may make it more difficult to read and perform other routine activities. This gradual change in the amount of tinting does not affect the sharpness of the image transmitted to the retina. With advanced lens discoloration, patients may not be able to identify blues and purples. They may be wearing what you believe to be a pair of black socks, only to find out from friends that you are wearing purple socks.

Age related Cataracts

The term "age-related" is a little misleading. You don't have to be a senior citizen to get this type of cataract. In fact, people can have an age-related cataract in their 40s and 50s. But during middle age, most cataracts are small and do not affect vision. It is after age 60 that most cataracts steal vision.

At risk populations for Cataracts

The risk of cataract increases as people get older. Other risk factors for cataract include:

- Certain diseases such as diabetes.

- Personal behavior such as smoking and alcohol use.
- The environment such as prolonged exposure to sunlight.

Protecting Vision

Wearing sunglasses and a hat with a brim to block ultraviolet sunlight may help to delay cataract risk. Smoking significantly increases the risk. Researchers also believe good nutrition can help reduce the risk of age-related cataract. They recommend eating green leafy vegetables, fruit, and other foods with antioxidants.

Patients over age 60 should have a comprehensive dilated eye exam at least once every two years. In addition to cataract, the eye care professional can check for signs of age-related macular degeneration, glaucoma, and other vision disorders. Early treatment for many eye diseases may save sight.

Symptoms and Detection

The most common symptoms of a cataract are:

- Cloudy or blurry vision.
- Colors seem faded.
- Glare. Headlights, lamps, or sunlight may appear too bright. A halo may appear around lights.
- Poor night vision.
- Double vision or multiple images in one eye. (This symptom may clear as the cataract gets larger.)
- Frequent prescription changes in your eyeglasses or contact lenses.
- These symptoms also can be a sign of other eye problems.

Cataract Detection

Cataract is detected through a comprehensive eye exam that includes:

1. **Visual acuity test.** This eye chart test measures how vision at various distances.
2. **Dilated eye exam.** Drops are placed in the eyes to widen, or dilate, the pupils. A special magnifying lens to examine the retina and optic nerve for signs of damage and other eye problems is used. After the exam, close-up vision may remain blurred for several hours.
3. **Tonometry.** An instrument measures the pressure inside the eye. Numbing drops may be applied to the eye for this test.

Treatment

The symptoms of early cataract may be improved with new eyeglasses, brighter lighting, anti-glare sunglasses, or magnifying lenses. If these measures do not help, surgery is the only effective treatment. Surgery involves removing the cloudy lens and replacing it with an artificial lens.

A cataract needs to be removed only when vision loss interferes with everyday activities, such as driving, reading, or watching TV. In most cases, delaying cataract surgery will not cause long-term damage to the eye or make the surgery more difficult.

Sometimes a cataract should be removed even if it does not cause problems with vision. For example, a cataract should be removed if it prevents examination or treatment of another eye problem, such as age-related macular degeneration or diabetic retinopathy.

For patients with cataracts in both eyes that require surgery, the surgery will be performed on each eye at separate times, usually four to eight weeks apart.

Many people who need cataract surgery also have other eye conditions, such as age-related macular degeneration or glaucoma.

Surgical Options

There are two types of cataract surgery:

1. **Phacoemulsification, or phaco.** A small incision is made on the side of the cornea, the clear, domeshaped surface that covers the front of the eye. The doctor inserts a tiny probe into the eye. This device emits ultrasound waves that soften and break up the lens so that it can be removed by suction. Most cataract surgery today is done by phacoemulsification, also called "small incision cataract surgery."
2. **Extracapsular surgery.** The doctor makes a longer incision on the side of the cornea and removes the cloudy core of the lens in one piece. The rest of the lens is removed by suction. After the natural lens has been removed, it often is replaced by an artificial lens, called an intraocular lens (IOL). An IOL is a clear, plastic lens that requires no care and becomes a permanent part of your eye. Light is focused clearly by the IOL onto the retina, improving vision. Some people cannot have an IOL. They may have another eye disease or have problems during surgery. For these patients, a soft contact lens, or glasses that provide high magnification, may be suggested.

Surgical Risks

As with any surgery, cataract surgery poses risks, such as infection and bleeding. Before cataract surgery, patients should temporarily stop taking certain medications that increase the risk of bleeding during surgery. After surgery, patients must keep their eye clean, wash their hands before touching their eye, and use the prescribed medications to help minimize the risk of infection. Serious infection can result in loss of vision.

Cataract surgery slightly increases the risk of retinal detachment. Other eye disorders, such as high myopia (nearsightedness), can further increase the risk of retinal detachment after cataract surgery. One sign of a retinal detachment is a sudden increase in flashes or floaters. Floaters are little "cobwebs" or specks that seem to float about in your field of vision. Patients who notice a sudden increase in floaters or flashes, should see an eye care professional immediately. A retinal detachment is a medical emergency. If necessary, go to an emergency service or hospital. A retinal detachment causes no pain. Early treatment for retinal detachment often can prevent permanent loss of vision. The sooner the patient receives treatment, the more likely they will regain good vision.

How effective is Cataract Surgery

Cataract removal is one of the most common operations performed in the United States. It also is one of the safest and most effective types of surgery. In about 90 percent of cases, people who have cataract surgery have better vision afterward.

The Surgical Procedure

At the hospital or eye clinic, drops will be put into the eye to dilate the pupil. The area around the eye will be washed and cleansed. The operation usually lasts less than one hour and is almost painless. Many people choose to stay awake during surgery. Others may need to be put to sleep for a short time.

After the operation, a patch may be placed over the eye. The medical team will watch for any problems, such as bleeding. Most people who have cataract surgery can go home the same day. No driving is allowed the day after the surgery.

Post Surgical Intervention

Itching and mild discomfort are normal after cataract surgery. Some fluid discharge is also common. The eye may be sensitive to light and touch. After one or two days, moderate discomfort should disappear. Avoid rubbing or pressing the eye. Patients should be instructed to try not to bend from the waist to pick up objects on the floor. Do not lift any heavy objects. They can walk, climb stairs, and do light household chores. In most cases, healing will be complete within eight weeks.

Post Operation Problems

Problems after surgery are rare, but they can occur. These problems can include infection, bleeding, inflammation (pain, redness, swelling), loss of vision, double vision, and high or low eye pressure. With prompt medical attention, these problems can usually be treated successfully.

Sometimes the eye tissue that encloses the IOL becomes cloudy and may blur vision. This condition is called an after-cataract. An after-cataract can develop months or years after cataract surgery.

An after-cataract is treated with a laser. The doctor uses a laser to make a tiny hole in the eye tissue behind the lens to let light pass through. This outpatient procedure is called a YAG laser capsulotomy. It is painless and rarely results in increased eye pressure or other eye problems. As a precaution, the doctor may prescribe eye drops to lower the eye pressure before or after the procedure.

Post Operative Vision

Vision may remain blurry for several days or weeks after the surgery. The healing eye needs time to adjust so that it can focus properly with the other eye, especially if the other eye has a cataract. Always check with the doctor as driving should not resume until vision is clear.

With an IOL, colors appear very bright. The IOL is clear, unlike the natural lens that may have had a yellowish/brownish tint. Within a few months after receiving an IOL, patients become used to improved color vision. Also, when the eye heals new glasses or contacts are usually needed

Current Research

The National Eye Institute is conducting and supporting a number of studies focusing on factors associated with the development of age-related cataract. These studies include:

- The effect of sunlight exposure, which may be associated with an increased risk of cataract.
- Vitamin supplements, which have shown varying results in delaying the progression of cataract.
- Genetic studies, which show promise for better understanding cataract development.

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