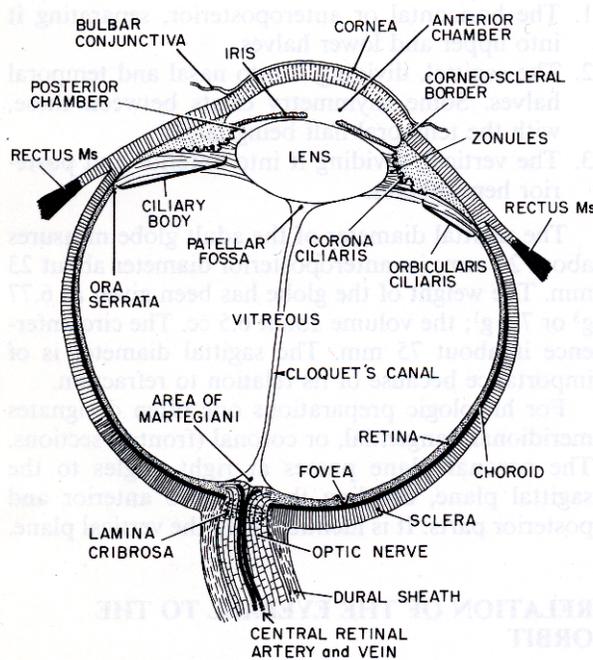


What You Should Know About Dislocated Crystalline and Intraocular Lens

By David J. Browning, MD, PhD

For purposes of explanation, the eye may be likened to a camera. Both contain a lens, which focuses incoming light and both have a thin film, which lines the back wall. In the case of the eye, this thin film is called the retina. It is nerve tissue capable of converting light into nerve signals, which travel to the brain via the optic nerve. The lens of the human eye is suspended by zonules, small cables located behind the iris, the colored tissue surrounding the black pupil. Figure 1 shows the structures of the human eye.

Figure 1. Anatomy of the Human Eye



Certain diseases cause the zonules to weaken and break, which in turn leads to decentering of the eye's lens. When it decenters, the lens can move through the pupil into the anterior chamber, where it can cause the pressure in the eye to increase. It can also float backwards into the vitreous gel where it causes annoying visual sensations. Whether the lens dislocates forward or backward, decentration degrades vision by moving the focusing device of the eye, but it can be surgically corrected. In a similar fashion, manmade plastic

intraocular lenses, implanted after cataract surgery, can become dislocated from their normal position behind the iris. This situation can be surgically corrected also. Dislocation of an intraocular lens after cataract surgery is estimated to occur in approximately 1 case in 500. The most common causes are an eye condition called pseudoexfoliation, which weakens the zonules holding the lens capsule in place, or a previous history of vitrectomy surgery, during which some of the zonules may be ruptured.

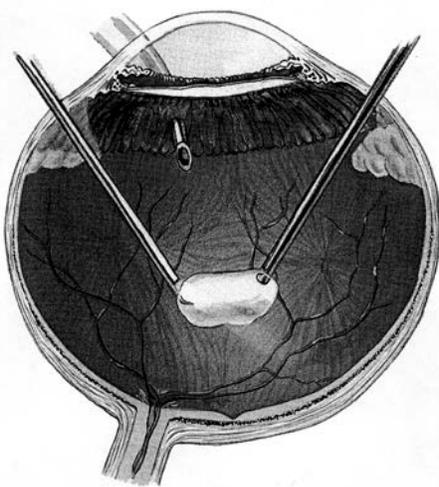
What Causes a Dislocated Crystalline Lens?

A number of hereditary diseases can cause the zonules to weaken and break. The most common is Marfan's syndrome, a disease in which the gene coding for the fibrillin protein is mutated. In a patient with this gene on chromosome 15, the disease will be transmitted on average to 50% of the patient's children. The zonules holding the lens in place are weak in patients with Marfan's syndrome, and the crystalline lens tends to decenter upwards and outwards. Other characteristics of patients with Marfan's syndrome are long arms and legs, hyperextensible joints, retinal detachments, and a high rate of aortic aneurysms.

Other much less common genetic conditions can cause dislocated crystalline lenses. Homocystinuria, Weil-Marchesani syndrome, hyperlysinemia, and sulfite oxidase deficiency are such conditions. All involve a genetic mutation, which can be passed down to children. All these diseases have other manifestations in the body. For example, homocystinuria leads to premature atherosclerosis and stroke. Finally, a hereditary condition called ectopia lentis et pupillae causes crystalline lens dislocation, but no other systemic abnormality.

Nonhereditary causes of dislocated crystalline lenses are more common than hereditary causes. The most common cause is blunt trauma, such as a fist injury or sports injury with a rubber ball. Infection with syphilis, a sexually transmitted disease, can also damage the zonules and cause crystalline lens dislocation.

How is a Dislocated Crystalline Lens Repaired?



When the dislocation becomes severe enough, an operation called vitrectomy and lensectomy is performed. Three 1-millimeter incisions are made in the white coat of the eye, the sclera. Saline solution is infused into the eye while a fiber optic light and a cutter are used to remove the vitreous gel and the dislocated lens in small, controlled bits. When these tissues are gone, a manmade plastic intraocular lens can be sutured into position behind the iris. Figure 2 shows an example of this procedure.

Figure 2. Illustration of Vitrectomy Surgery

Is Surgery Always Necessary?

No. In the early stages of a dislocated crystalline lens, a simple prescription eyeglass or contact lens change may be sufficient to restore functional visual acuity. However, if the crystalline lens moves enough, these conservative measures fail, and surgery is the preferred option for restoration of vision.

What are the Risks to Surgery?

There are risks of surgery, and there are risks of not having surgery. The major risks of surgery are infection, which occurs in approximately one case out of 1500 operations, or retinal detachment, which occurs in approximately one case out of 30 operations. Other less severe risks include droopy eyelid, double vision, and high pressure in the eye after surgery, or bleeding inside the eye. The risks of not having surgery are related to the malpositioned lens. If it moves to the front of the eye, the pressure inside the eye may increase. Sometimes the lens releases proteins, which lead to inflammation inside the eye. Most importantly, the eye does not see well with the lens out of position.

Final Comments

Once you have read this brochure, if you have any questions, you are welcome to call my office, at (704) 295-3180, or we can discuss them at your next appointment. If you would like to find more in-depth information about dislocated intraocular and crystalline lens, an excellent resource is the National Library of Medicine website section called PubMed. It can be accessed via any search engine, or directly at this link, <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>. It includes an extensive database of articles published in peer-reviewed medical journals from all over the world.