



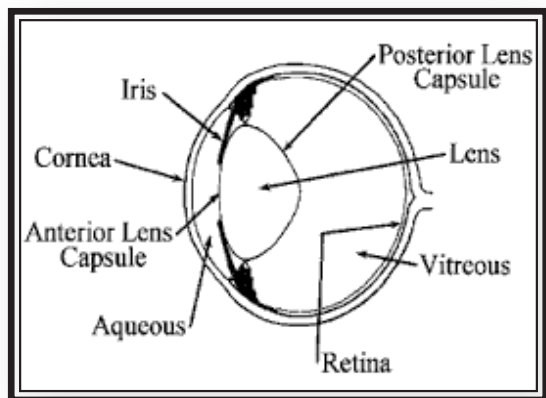
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Cataracts and Cataract Surgery in Dogs

What is a cataract?

The lens of the eye is located between the iris and the retina and is used for focusing images on the retina. A cataract is any opacification of the normally crystal clear lens that results from alteration of its protein and/or membranous constituents. The opacity can be very small (incipient cataract) and not interfere with vision; it can involve enough of the lens to cause blurred vision (immature cataract); or if the entire lens is involved the cataract is mature and only light and dark perception remains. Some mature cataracts will transform over time into hypermature cataracts in which the lens shrinks due to escape of water and proteins. Hypermature cataracts vary in how dense they are and may allow some vision provided the rest of the eye is functional.



Schematic anatomy of a canine eye

With aging dogs and cats develop a hardening of the lens center (nuclear sclerosis) that causes the lens (as seen through the pupil) to appear a dull gray-blue rather than the shiny black appearance of a young dog. Nuclear sclerosis is not a cataract, and usually does not interfere with functional vision.

Cataract may, however, accompany nuclear sclerosis and many geriatric dogs do develop cataracts, the majority of which are not clinically significant. Dogs can see fairly well if their cataracts are small. Dogs also can adapt well if one eye is blind from cataract and the other is not. Dogs can also adjust—up to a point—if both eyes gradually develop mature cataracts by creating a “memory map” as to the location of objects in their familiar environment and dog owners may not be aware that they have a vision problem until it is advanced in both eyes.

What causes cataracts in animals?

Cataracts have many causes in dogs, and it is not always possible to identify the cause of cataracts in affected patients.

- Most cataracts in dogs are inherited and can occur at any age. Different breeds of dogs have different characteristics of age of onset, location within the lens, and extent and rate of progression.

For example, inherited cataracts in the Siberian Husky appear about a year of age and progress slowly, if at all. Cataracts in Bichon Frise dogs tend to develop rapidly in early adulthood while Boston terriers experience cataractogenesis with slow progression later in life. Mixed-breed dogs can also develop inherited cataracts.

- The second-most common cause of cataracts in dogs is diabetes mellitus. Virtually every diabetic dog will develop cataracts, most within the first year of being diagnosed as diabetics. Diabetic cataracts develop rapidly and may be accompanied by complicating factors including lens-induced uveitis, phacomorphic glaucoma, and spontaneous lens capsular rupture.
- The third most common group of cataracts in dogs are those that occur secondary to other eye disease including retinal degeneration, primarily Progressive Retinal Atrophy (PRA); uveitis (intraocular inflammation) of any cause; and glaucoma (increased intraocular pressure).
- Cataracts will occur if the lens capsule is ruptured due to trauma which can be penetrating (such as a cat claw or pellet gun injury) or blunt. The lens contents exude through the defect in the capsule and cause both cataract and a severe uveitis which may not manifest until several weeks after the injury occurred. Lens capsules can also rupture if the lens swells, causing the capsule to stretch and split open, which occurs most commonly in diabetic cataracts.
- Nutritional cataracts can develop due to dietary deficiencies, such as occurs in puppies on an artificial milk-replacer diet. They often will improve as the puppy matures.
- Dogs also can develop cataracts with age (often after 8 years of life). However, age-related cataracts in dogs are usually small and do not significantly interfere with vision.
- There are many other potential but infrequently encountered causes of cataracts in dogs, such as birth defects and radiation (usually from prolonged radiation therapy for cancer of the head

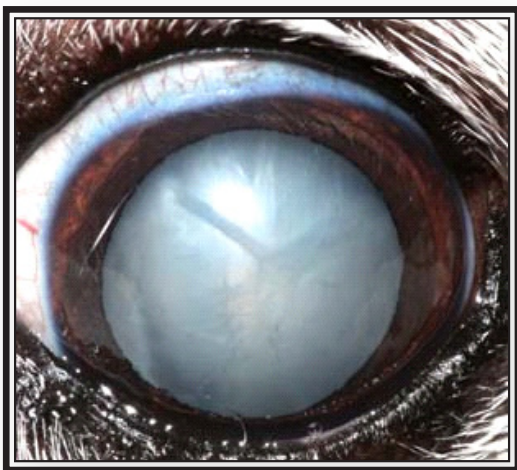


Photo by Claudia Busse , Vet Experts October 24, 2013
Diabetic cataract in a dog

Lens-induced uveitis

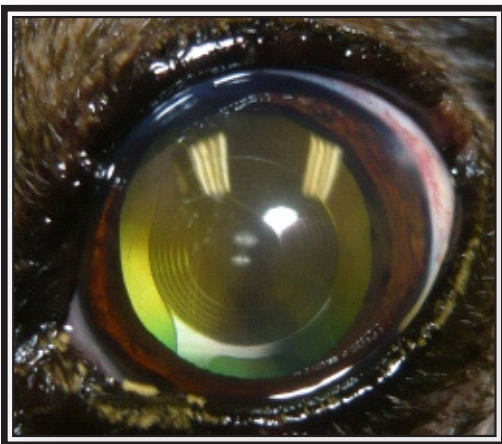
In some cataracts, especially with those in young animals or following rupture of the lens capsule, escape of lens proteins into the vitreous or aqueous chamber will induce an immune-mediated inflammatory response in the eye termed lens-induced uveitis or LIU. LIU, in turn, can lead to glaucoma, retinal detachment, and/or lens dislocation (separation of the lens from its anchoring attachments), allowing the lens to float around inside the eye and cause damage and pain). If severe or untreated LIU may damage an eye such that cataract surgery is no longer an option.

Cataract surgery

Once a lens has developed a cataract, there is no known effective medical treatment; fortunately surgical removal of cataracts offers a predictable means to restore vision to our patients. The procedure is indicated when the cataract results in a decrease in functional vision; unilateral or incipient cataracts or cataracts experiencing resorption may not require surgery.

Cataract surgery can give a dog a wonderful new lease on life. For a blind dog to again be able to see its owner, to play with toys, and look out the window at the squirrels is life-changing for canine patients and their owners. This is especially true if the dog is elderly and hard of hearing or has senile dementia and cognitive issues; restoration of vision can make a huge difference in quality of life. If both eyes are affected, surgery may be performed on both at the same time.

The disease and cataract surgery are similar to humans. Animal patients require general anesthesia. The procedure is performed with the aid of an operating microscope. A small incision is made into the eye and a window is constructed in the capsular bag that surrounds the lens. Phacoemulsification is then performed through this window as a special probe ultrasonically emulsifies and removes the cataract. After the cloudy lens is removed, the empty lens capsule remains and serves as a scaffold for an artificial intraocular lens (IOL). IOLs are either rigid polymer plastic lenses or soft foldable lenses, the choice of which is determined by the ophthalmologist and the course of the procedure. In rare instances, placement of an IOL is not possible at the time of cataract surgery. These dogs still acquire vision, but are more far-sighted and near objects will appear blurred. Finally the eye is sutured closed with very fine absorbable sutures.



*Image by Woodcroft Vet Group
Intraocular lens in a dog eye following
Cataract surgery*

How well will my dog see after cataract surgery?

Normal vision is the goal of cataract surgery with IOL implantation. Related to variation in individual anatomy and healing response visual perfection may not be achieved and your pet may have occasional visual miscues. However the function of both animals with (pseudodophakic) and without (aphakic) intraocular lenses far exceeds that of an animal blinded by cataracts.

Why is cataract surgery so expensive?

Cataract surgery is costly because it requires specialized instrumentation, supplies, anesthesia, and training (a minimum of two years). In veterinary medicine most pet owner bear 100% of the cost of cataract surgery. Pet health insurance policies often exclude cataract surgery because the cataracts are often genetic and most insurance companies will not cover genetic or pre-existing conditions. If

you have health insurance for your dog, do not assume it will cover cataract surgery—check with your insurance provider in advance.

What if cataract surgery is not done?

Most dogs that are blinded from cataracts can adequately adjust to their vision loss, with a positive although diminished quality of life, if they are in a safe and stable environment and their eyes are not painful. The risk of LIU or lens dislocation persist however.



Elizabethan collar post-cataract surgery, ready to go home!

What is involved in having cataract surgery performed on my dog?

The first step is to have your pet examined by an ophthalmologist to determine if your pet is a good candidate for surgery; pre-operative testing includes a preoperative blood profile, comprehensive physical exam, and assessment of anesthetic level of risk. We attempt to co-manage our patients with your family veterinarian. Electroretinography (ERG), ultrasonography of the eye, and gonioscopy (in breeds predisposed to glaucoma) are undertaken at our hospital. These tests are non-invasive and are performed with the patient awake or with sedation, and cause no discomfort. ERG testing evaluates retinal function, critical for the success of the procedure. Gonioscopy evaluates the drainage angle of the eye to determine if the eye(s) are at increased genetic risk of developing glaucoma; if this is the case pressure-lowering medication may be prescribed post-operatively. Ultrasonography determines if retinal detachment is present.

If your dog “passes” the preoperative testing, surgery can be scheduled. Pre-operative medications are prescribed to minimize risk of infection, temper post-operative inflammation, and dilate the pupil. Your pet will need to arrive at the hospital early in the morning on the day of surgery and will go home the same afternoon. Oral antibiotics and anti-inflammatories are prescribed for the first postoperative week and the drops used before surgery as well as pressure drops if necessary are continued. Topical medications may be required on a long-term basis.

Vision usually improves during the first week after surgery—often within 24 hours—but the return of functional vision sometimes takes up to 2–3 weeks. Tiny stitches hold the eye together and no good

will come if they break; your pet must wear a cone-shaped restraint collar (E collar) for the first 2 -3 weeks after surgery to protect the eyes. Post-operative examinations are scheduled at 1 day, 5 - 7 days, 2 - 3 weeks, 8 - 10 weeks, and 4 - 6 months post surgery, and every 6 to 12 months thereafter. This reexamination schedule may change if there are post-operative complications.

What are the risks involved with cataract surgery?

Cataract surgery is a predictable procedure, with success rates that approximate 90%, but 5% to 10% of dogs will not regain good vision due to complications, and (worst case scenario) may actually be permanently blind in one or both of the operated eyes. Eyes with cataracts of long duration or hypermature lenses have a slightly greater complication risk. These complications include:

- Glaucoma. Glaucoma (increase in eye pressure) occurs transiently in 30% of dogs that have cataract surgery, usually within the first 24 hours after surgery. Most of the time these pressure increases are temporary and quickly resolve with treatment within the first 1–2 days after surgery. In less than 5% of patients glaucoma can develop months to years following surgery and untreated can lead to blindness. Risk is greater in breeds that have a prediction for glaucoma, including American cocker spaniels
- Retinal detachment. Separation of the retina from the back of the eye and its blood supply is a potentially blinding complication of cataract surgery that occurs in approximately 1-2% of patients, usually in the first few postoperative months. While surgical re-attachment of the retina is sometimes possible, this complication usually results in complete vision loss. However, if it is caught early the surgical success rate is much higher.
- Infection. Infection of the eye manifests in the first 1-2 postoperative weeks and while rare (less than 1%) may cause not only blindness but the necessity of removing the eye.
- The risk of general anesthesia. Anesthesia safety has progressed tremendously during the last 5 years. However, even healthy pets can succumb to the effects of anesthesia on cardiac and respiratory function. We take anesthesia very seriously. All patients are monitored extensively by our surgical team. All patients receive electronically assisted ventilation and monitoring of their blood oxygenation, carbon dioxide levels, respiration, temperature, heart function, and blood pressure.