



JRTRF Newsletter

SUMMER 2007

EDITOR RUTH CAMP
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Now is the time to update your kennel records, focusing on any terriers that have developed eye problems (or any other disorders) in the last 2 years, especially those entered in the DNA bank as previous "normal".

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JRTRF Website

<http://www.jrt-research.com/>

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Canine Cataracts

1) Definition of Cataracts

The word cataract literally means 'to break down'. This breakdown refers to the disruption of the normal arrangement of the lens fibers or its capsule, which results in the loss of the transparency of the lens and a reduction in vision. Cataracts often appear to have a white or crushed ice appearance and are found in the lens of the eye.

A cataract is a clouding of the lens inside the eye and is the most common cause of blindness in dogs. Cataracts can be caused by injuries or diabetes, but most cataracts in dogs are inherited. Any opacity in the lens is called a cataract; very small spots do not significantly affect vision. However, most cataracts will progress, and ultimately cause blindness.

The lens is located behind the colored iris; thus when a cataract occurs, the pupil may appear white. Vision through a mature cataract is like looking through white painted glass. It is important to note that a cataract is not a growth.

2) How do cataracts form

Despite the fact that there are several different types and causes of cataracts, they all develop in a similar fashion. The normal lens is maintained in a dehydrated state. It consists of 66% water and 33% protein. There is a sodium-water pump system in the lens that keeps this water/protein balance in check. When the biomechanical system in the lens is damaged, this pump system begins to fail and extra water moves into the lens. In addition, the percentage of insoluble protein particles increases. These changes result in the loss of transparency and cataract formation.

3) What causes cataracts

There are many different forms and causes of cataract formation. They affect all breeds and ages of dogs, but certain types show up more commonly in specific. Despite the fact that cataracts are far too common, there is still a lot that we do not know about canine cataracts.

Cataracts may be present at birth (congenital) or develop later and can be caused by infections (such as canine herpes virus, canine parvovirus-2 and canine adenovirus-1), injuries, poor nutrition (i.e. puppy milk replacers), radiation therapy or toxins.

Many cataracts will worsen to the point of blindness but certain types can remain small for the entire life of the patient.

The most common **metabolic disorder** resulting in cataract formation in the dog is diabetes mellitus. If diabetic dogs are followed for a year or more, almost all of them will develop cataracts. In diabetic dogs, the glucose concentrations in the lens increases. The extra glucose is converted into sorbitol, which causes an increase in the influx of water to the lens. The increase in water causes a breakdown of the lens fibers and a resulting cataract. Cataracts in diabetic dogs can develop extremely rapidly if the dog's sugar is not regulated. This type of cataract will generally affect both eyes. Surgical removal of the lens can be successfully performed in the diabetic dog, if the animal has been regulated successfully for at least three months.

Hypocalcemia (low blood calcium) resulting from renal failure is another cause for cataract formation in dogs. Hypocalcemia may be brought on by poor nutrition and homemade diets are the greatest offender. The ideal dog's diet contains a ratio of calcium to phosphorus of 1.2 to 1. Liver, for example, has a calcium to phosphorus ratio of 1 to 15. Although liver is small rations is great for dogs, fed in large percentages the calcium to phosphorus ratio is improper. Low blood levels of albumen, caused by dietary protein deficiencies and sometimes kidney diseases, will cause low calcium levels.

Puppy Milk Replacers (see article on Nutritional Cataracts)

Trauma from an automobile accident or penetration of a thorn, shotgun pellet, or other object may damage the lens and a cataract may develop. These types of cataracts usually only occur in one eye and can be treated successfully with surgical removal. Electric shock (a puppy bites an electric cord) can result in anterior subcapsular cataracts.

Disophenol, given for the treatment of hookworms has been shown to cause cataracts but are usually reversible after the drug is discontinued.

4) How do you classify cataracts

Cataracts are classified in multiple ways which leads to confusion.

Classification by stage of formation: the basis of stage of formation may be meaningful because this describes the progression of most cataracts regardless of cause.

Incipient - when first evidence of opacification is seen. Vision is not affected. The opacity may or may not progress.
(<http://cvm.msu.edu/courses/AP/ataract/types/incipient.htm>)

Incomplete (also called immature) - lens is largely, but not completely, opaque. The patient may have some vision; a tapetal reflex is visible. The lens may be slightly enlarged due to imbibition (absorption of fluid by a solid, causing swelling) of water.
(<http://www.animaleyecare.net/diseases/ataract.htm>)

Complete (also called mature) - lens is totally opaque preventing vision in that eye. The lens may be enlarged due to imbibition of water.
(<http://www.animaleyecare.net/diseases/ataract.htm>)

Complete with shrinkage (also called hypermature) - remaining lens fibers are opaque, but there is a reduction in this material as well as water, causing a decrease in the size of the lens, usually through flattening. If the capsule is clear, the patient may be able to see through portions where little to no cortical material remains or around the lens if shrinkage results in a smaller diameter.
(<http://www.el-minjas.com/ataract3.jpg>)

Classification on basis of age: The age of onset can be important in determining whether the cataracts present are the result of a hereditary trait.

Congenital - present at birth. These will usually occur in both eyes. Just because a dog is born with cataracts does not unavoidably mean they were inherited. Infections in utero or nutritional deficiencies may be the cause.

Developmental (Early Onset or Juvenile) - develops sometime after birth, but generally before adulthood (2-5 years) - many of the heritable and nutritional cataracts fall into this category.

Degenerative (Senile or Late Onset) - cataract formation after normal development. These cataracts occur in dogs over six years of age. Nuclear sclerosis is often confused with cataracts at this age.

Classification on where they occur: "On the CERF form, cataracts are separated into those that occur in the anterior cortex (those occurring in front of the nucleus), the posterior cortex (the cortex behind the nucleus), the equatorial cortex (around the lens periphery), or within the nucleus itself. Cataracts that involve the suture lines are separated into anterior or posterior suture line cataracts. All cataracts are further described by size. Punctate indicates small, focal cataracts. Intermediate describes those involving a larger area of the lens than punctate. Diffuse cataracts refer to those involving an entire area. Generalized cataracts involve all areas of the lens." Thomas Miller, DVM, DAVCO

5) What are Y-suture cataracts?

Granular clumping along the arms of the Y-sutures. Not uncommon. It is important in that it progresses in some animals and it may represent a variable expression of a heritable cataract.

6) Treatment Options

There are no medications which are effective in treating or preventing cataracts. Treatment requires surgical removal of the lens and once removed, a cataract cannot recur. Cataracts are not treated with lasers; the most common surgery to remove the lens uses phacoemulsification, ultrasonic fragmentation of cataract. For a successful outcome, the affected animal must undergo a thorough examination to determine if he/she is a good surgical candidate. Diabetic animals that are not regulated, aggressive animals that are difficult to treat daily, or animals in poor or failing health, are not good surgical candidates.

7) How about non-surgical treatment? eye drops, etc.

There is currently no good non-surgical treatment for this condition.

8) Complications

Cataract surgery is approximately 90-95% successful. However, this means that in 5-10% of cases, complications may prevent vision recovery. The purpose of the examinations before and after surgery is to detect and prevent these complications whenever possible. In uncomplicated cases, vision will begin to improve within a few days; after six weeks, healing is usually complete and medication is discontinued.

9) Signs/symptoms my dog may have cataracts

Signs of vision loss are usually not detected by the owner until the cataract occupies 40-50% of the lens. Oftentimes, this needs to occur in both eyes for the dog's vision to be negatively affected.

10) Management of cataracts found in a breeding program

"These statements pertain to any potentially inherited cataract (i.e., cataract for which another cause is not found):

Usually the sire and dam of any litter or pups with cataracts are not bred again to

each other, and the breeder needs to think long and hard about whether to breed them again at all. The safest advice is to retire them from breeding.

Any dog with cataracts should not be bred.

It is undecided what to do with the siblings of affected dogs because the genetics of cataract inheritance is known in so few breeds. It is a bit risky to use the siblings as breeders, but it is hard to know how risky if only one dog in the litter is affected. If multiple dogs are affected, then the safest advice is to neuter all the dogs in the litter and be careful about other (younger or older) siblings." Dr. Rhea Morgan, DVM, Diplomate ACVO

Nutritional Cataracts

By Dr. Lisa Meek, Member ACVO

A nutritional cataract is caused by either a deficiency or excess of a nutrient resulting in a loss of transparency of the lens. Nutritional cataracts have been identified in various species, including rats, pigs, wolves, fish and guinea pigs as well as dogs and cats. In dogs and cats the most common cause of nutritional cataracts is being hand raised on milk replacer.

It is usually possible to differentiate nutritional cataracts from inherited cataracts. The location of the cataract within the lens is fairly unique compared to other cataracts. The cataract is present within a few weeks of starting milk replacer. When combined with a history of being hand raised, the diagnosis is usually straightforward. Also, inherited cataracts rarely occur at such early ages (with a few exceptions).

Nutritional cataracts usually do not progress to interfere significantly with vision. Some will improve with age, as the young lens has some ability to repair itself. The younger the pup is when switched from bitch to hand raising, the more likely it is to develop nutritional cataracts. Also, the sooner it is started on solid food, the sooner the lens can stabilize and improve.

Numerous studies have been performed to try to identify specific causes of nutritional cataracts. Most studies have implicated abnormal amino acid levels, with the specific amino acid implicated varying from species to species. Arginine deficiency has been implicated as the most likely cause of nutritional cataracts in dogs. Most of the commercial milk replacers do not contain added arginine. One exception is Nurturall by VPL. All of the commonly available milk replacers (Esbilac, Havolac, Unilact, Veta-lac, and Nurturall) have lower protein levels than bitches milk. Bitches milk has approximately 10.7% protein, cows and goats milk 3.5% protein, and the above mentioned supplements range from 4.5% protein to 7.5% protein.

There have been no studies evaluating home made diets, but it is known that meat is a good source of arginine. Therefore, one of the most common recommendations has been to add beef or liver baby food to the milk replacers. Since no studies have been performed evaluating this combination, there are not specific recommendations as to how much baby food should be added.

The specific recommendations that I can make are the following:

1. If pups cannot be raised on the bitch, then try to find a wet nurse for them.
2. The longer the pups are on bitches' milk, the less likely they are to develop nutritional cataracts.
3. If they cannot be raised on bitches' milk, add as much beef or liver baby

food to the milk replacer as you can without causing GI upset and still keep it liquid enough to drink.

4. Add puppy diet as soon as possible.
5. Consider using Nurturall since it has the highest protein level of the available milk replacers and has added arginine, if bitches' milk is not available.

(Ed. Note: Recent ads in the AKC Gazette also show "Just Born" milk replacer as having the arginine added and the protein content of this product is also 7.5%. Nurturall is available from Veterinary Products Lab in Phoenix, Arizona (800) 548-2828 and Just Born is by Farnam, also in Phoenix (800) 234-2269).

Sometimes putting a face to the problems our terriers face help to make an impact on how we look at things. Thank you Darlene, Tina and Sherri for sharing your stories of your dear terrier friends.

HOPE

Hope was born with Cerebella Ataxia. Cerebella Ataxia is a defect in the part of the brain that controls balance. Hope seemed normal to us at birth, however, by the time she was between 2-3 weeks old, it was apparent that there was a problem. Hope just laid in the whelping box while her siblings got up and played all over her. A neurologist confirmed our fears, but we decided to keep Hope and give her the best life possible. While she does not walk like a normal dog, she is able to play with our other terriers and has brought us much joy. Hope will be 5 years old this July.

Darlene McInnes



ANGEL

Angel AKA The Barking Lot's Minnie Might born in Yelm WA on June 18th 1996. She was the runt of her big litter of 6 pups. Angel has always been a true JRT in every characteristic of the breed. She is brave beyond belief in this little girl, Dominants to a fault with her JRT pack, Yet very loving to her human family. She has won Champion in numerous GTG, racing, & agility competitions, I took her to Nationals once which was the year of 9/11, I showed her in 2 classes spay bitch and agility she got 1st place out of 20 something in conformation and 4th place in agility. I also took her hunting in Kansas with Stephanie Poppe and The Fentons she successfully bolted a Ground Hog. I have taken Angel to get CERF tested every year since she was born until I spayed her with a clean test every time. I skip a few years with her but thought I would take her to get checked when I took a breeding bitch of mine to get checked, Angel was 7.5 yrs of age when she was diagnosed with a pin head cataract at that time. About 6 months later I noticed she would bark at me while competing at the agility trials and her left eye was clouding up. When she was 9 yrs. old I noticed that her left eye was starting to turn blueish grey it wasn't long after that she was totally blind in that eye. Then I noticed that her right eye was starting to get cloudy yet she could still see where she was going. I entered her in agility in Feb. 2007 on Friday she could see by Sat. afternoon she couldn't see me throw the ball for her to fetch. These cataracts progress very fast, Angel is still that brave, head up, proud little terrier even when she bumps into the wall for the door or trips down the stairs barking at something with the rest of the terriers. We call her badger girl when she tries to find the stairs. She will be 11 years old in June.
Tina Stafford



REBA

Reba is a multiple Working and Open Terrier Champion, in addition to having her working certificate to groundhog. Reba was about 4 years old

when her CERF tests started coming up "abnormal." None of the ophthalmologist's that examined her could pinpoint what was wrong with her. At 5, Reba's right lens luxated and had to be removed due to a condition called Primary Lens Luxation, or PLL. Three weeks later, the other lens luxated and that was also removed. Even though people told me I should "put her down", Reba was given a chance to live life as a blind dog. To this day, Reba rules the roost around our farm and has even competed in the Master's Den at the Rainier Classic trial.

Sherrí Rossmiller



The Research Foundation wishes to thank the following generous donors for 2007.

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Don't Forget the DNA Clinic at the JRTCA Nationals

Tentative Hours of Operation:

Friday, October 19 12 noon to 4 p.m.

Saturday, October 20 1 p.m. to 5 p.m.

Sunday, October 21 11 a.m. to 3 p.m.

Remember to bring copies of pedigrees, BAER and CERF certificates!