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College of Veterinary Medicine

Treatment of Cataract in Dogs

A Graduation Project Submitted to the Department Council of the Internal and Preventive Medicine-College of Veterinary Medicine/ University of Al-Qadisiyah in a partial fulfillment of the requirements for the Degree of Bachelor of Science in Veterinary Medicine and Surgery.

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من سورة طه

Certificate of Supervisor

I certify that the project entitled (Treatment of Cataract in Dogs) was prepared by **(**Ibraheem Mahmoud Hassan & Zahraa Sameer salman**)** under my supervision at the College of Veterinary Medicine / University of Al-Qadisiyah.

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-- / -- / 2021

Certificate of Department

We certify that **(**Ibraheem Mahmoud Hassan & Zahraa Sameer salman**)** has finished his/her Graduation Project entitled (Treatment of Cataract in Dogs) and candidate it for debating.

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ABSTRACT

This research project is performed to find ways about the suitable and economical treatment of cataract in dogs. To be able to prosper in their environment, dogs need healthy eyes. Evolution has provided dogs with a very keen sense of vision and the ability to see in extreme conditions of light and darkness and to be highly perceptive of movement. At times, injuries to the eye and the surrounding lids and gland, or disease, will disrupt vision. Unfortunately, highly complex structures such as the eye, may also suffer from defects in ocular development, such as the formation of cataracts. The word "cataract" describes the opacification of the crystalline lens of the eye. The word owes its origin to the erroneous belief that a sort of curtain fell down like a waterfall from the "humour" of the brain. In fact, the lens protein becomes denatured and disrupted destroying the optical clarity. The importance of a good long term surgical result is emphasized by taking a global view of the problem. Cataract is the most common cause of treatable blindness in dog and posterior capsule opacification post operatively is the most common unwanted result. The essential success of any lens surgery lies in maintaining a perfectly clear posterior capsule permanently. Any technique that improves the permanent clarity of the capsule, even by a small percentage, benefits the pets both medically and economically was discussed. Cataract surgery is now extraordinarily successful. Cataract removal and intraocular lens (IOL) implantation is by far the most common and one of the most successful of all operations in all of medicine, and probably the most common surgery performed around the world each day because there is no effective medical treatment for cataract

Introduction

Cataracts in dogs it begin to notice a bluish white film start to develop over the eyes, as dogs age, eye problems - particularly cataracts - are more common, the condition is a thickening of the lenses, which is a function of age, it can become present in dogs of any age but normally happens as the dog enters their senior years and it tends to progress slowly. (1)

True cataracts are a total thickening of the lenses, so that light cannot come through the pupil and sight is lost, certain injuries and infections can cause cataracts, and the condition is sometimes a sign of diabetes. (2)

There is a disease, juvenile cataracts, in which cataracts appear at a very young age (as early as I year old), first in one eye and then in the other. (3)

This is an inherited disease, seen more commonly in Irish Setters, Afghans and Old English Sheepdogs, the only way to prevent blindness is to surgically remove the lenses, dogs are nearsighted anyway- they can't adapt their vision to distances so the removal of the lens is something they can live with quite comfortably without much noticeable difference in eyesight. (4)

All geriatric dogs (usually beginning at 6 years of age) develop a hardening of the lens (Nuclear Sclerosis) that causes the lens to have a grayish appearance, the grayish-blue haze increases as the dog ages, nuclear sclerosis is not a cataract, and does not usually interfere with vision, the photo to the right shows a normal geriatric dog eye with normal nuclear sclerosis, nuclear sclerosis also occurs in humans, and the hardening of the lens with age results in reduced near-vision in people; this is why people in their 40's and older need reading glasses because their lenses no longer are soft enough to easily change shape to allow for near vision. Another name for this is presbyopia, which means "old eye", dogs do not have good near-vision to begin with (compared to people), so nuclear sclerosis does not significantly interfere with their near-vision. (5)

The present study is aimed to investigate:

- Predisposing causes and symptoms of cataract in dogs.
- The suitable and beneficial surgical treatment for cataract.
- The alternative medical treatment for cataract.

Cataract Formation

Some cataracts are genetic and it is a problem that is more common in certain breeds, the lens is a refractive structure within the eye, in a healthy condition, it is optically clear, it continuously grows through life, but it does so in such a way that the center becomes more compact, a normal change with age, then, is a condition called "lenticular sclerosis". (6)

The condition of lenticular sclerosis should not be confused with an actual cataract , it is a senile alteration of lens fibers resulting in an absorption of some of the wave lengths in the visible spectrum, the dog's vision is not changed significantly. (7)

In contradistinction to lenticular sclerosis, a cataract is an apparent opacity within the lens that will not allow the passage of light , many false concepts have occurred due to nomenclature, cataracts can be classified according to types. In general, most authorities agree on the following chronological classifications:

A) Congenital-bornwith.
B) Juvenile - occurring in a young dog under five years of age.
C) Senile - occurring in an older dog over five years of age, the cause of canine cataracts - whether hereditary or acquired - may be influenced by many factors including the effects of inflammations, toxins, metabolic defects, trauma, radiation, and many more. (8)
It becomes obvious that the term juvenile cataracts only means that a young dog has cataracts and the condition could be either acquired or hereditary, much work is necessary to elucidate the potential hereditary mechanism which may be present, medical therapy is of no avail and surgery is necessary if restoration of vision is to be accomplished. (9)

The lens is made mostly of water and protein, specific proteins within the lens are responsible for maintaining its clarity, over many years, the structures of these lens proteins are altered, ultimately leading to a gradual clouding of the lens. Rarely, cataracts can present at birth or in early years of age as a result of hereditary enzyme defects, and severe trauma to the eye, eye surgery, or intraocular inflammation can also cause cataracts to occur earlier in life, other factors that may lead to development of cataracts at an earlier age include excessive ultraviolet-light exposure, diabetes, or the use of certain medications, such as topical, or inhaled steroids, other medications that are more weakly associated

with cataracts include the long-term use of statins and phenothiazines. (10)

Causes of Cataract

* Most cataracts in dogs are inherited and can occur at any age,the cataract may develop rapidly over weeks, or slowly over years, and occur in one or both eyes, different breeds of dogs have different characteristics of cataract development, for example, cataracts in Bichon frise dogs tend to develop rapidly in early adulthood and usually involve the entire lens in both eyes, mixed-breed dogs can also develop inherited cataracts.
* The second-most common cause of cataracts in dogs is diabetes (diabetes mellitus). 75% of diabetic dogs will develop blinding cataracts within the first year of being diabetic. Often, the cataracts form very shortly after the dog becomes diabetic, Diabetic cataracts develop very fast-often overnight-in dogs, and they are a medical and surgical emergency.
*The third most common cause of cataracts in dogs is a toxic reaction in the lens due to some other ocular disease or (much less commonly) due to a drug reaction, these are called "toxic cataracts", toxic cataracts caused by ocular disease are quite common in dogs, and are caused by:
1) Retinal degeneration, especially Progressive Retinal Atrophy (PRA).
2) Uveitis (intraocular inflammation) of any cause, including trauma; and
3) Secondary to glaucoma (increased intraocular pressure) of any cause.

* A special type of cataract occurs in dogs in which the lens capsule is ruptured due to trauma, the trauma can be penetrating (such as a cat claw injury or pellet gun injury) or a severe blow to the eye that results in lens capsular rupture, the lens contents leak out through the hole in the capsule and cause both cataract and a severe immune-mediated reactive uveitis; the uveitis does not usually "peak" in severity until 2-3 weeks after the injury occurred, it is not always apparent that the lens capsule has ruptured; often, by the time this is diagnosed it is too late to save the eye and the eye needs to be removed, thus, it is prudent to seek immediate medical attention for any injury to your dog's eye, lens capsules can also rupture if the lens swells, causing the capsule to stretch and split open, this can happen in diabetic dogs and in some types of inherited cataracts that rapidly form. Cataracts can also develop due to nutritional deficiencies in dogs, such as orphan puppies on an artificial milk-replacer diet, these are called nutritional cataracts, and 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 causes of cataracts in dogs, such as birth defects, radiation (usually from prolonged radiation therapy for cancer of the head), infection, etc. (22)

CONGENITAL HEREDITARY CATARACT

Cataract is defined as any opacity of the lens and/or its capsule. Congenital inherited cataract involves the central embryonic and foetal nuclear portion of the lens, whilst those lens fibres which make up the usually remain transparent, thus congenital nuclear cataract is often described as stationary, with the effect on the dog's sight being dictated by the extent of the opacity, such patients may be managed by using long acting mydriatic drugs, but when cortical involvement occurs lens removal may prove necessary. (11)

The condition occurs as a recessive trait in the Miniature Schnauzer and there are clear indications that it may become established in other breeds like the Old English Sheepdog, Golden Retriever and West Highland White unless breeders respond adequately to early findings in these breeds, congenital cataract may also accompany microphthalmos in breeds like the Cocker Spaniel, Cavalier King Charles Spaniel, Rottweiler, Rough Collie, Doberman, Old English Sheepdog, Standard Poodle and West Highland White Terrier as part of a multiocular defect, congenital cataract can involve the lens capsule as a secondary feature of Persistent Hyperplastic Primary Vitreous (PHPV) or Persistent Pupillary Membrane (PPM), remnant pupillary membrane may render the anterior capsule opaque at the points of attachment whilst varying degrees of posterior capsular opacity and posterior cortical cataract may accompany PHPV. (12)

Diagnosis of congenital cataract is possible from the age of five or six weeks as part of a routine litter screening programme, PPM is best detected before a mydriatic is used, but the use of a mydriatic is essential for the diagnosis of nuclear cataract or PHPV associated cataract. (13)

DEVELOPMENTAL HEREDITARY CATARACT

Opacity of the lens is relatively common in the canine species and several causes ranging from dietary amino acid deficiency in young dogs to senility may be described, inherited developmental cataract may appear at any age after birth but mainly affects young to middle aged subjects, it is the pattern of opacity coupled with the age of the dog which dictate the diagnosis of hereditary cataract (HC). (14)

The lens enlarges throughout life due to the constant production of new fibres which are laid down around the embryonic and foetal nuclear material, these new fibres make up the lens cortex and it is their abnormal formation due to factors as yet undetermined which is responsible for cataract development, both dominant and recessive inheritance traits are involved in H.C. and there is considerable variation in the presenting clinical picture and associated prognosis, for example, a 5% incidence of posterior polar cataract in the Labrador and Golden Retriever breeds has to be tempered with the fact that only 5% of these dogs go on to develop a generalised cortical cataract which necessitates surgery.(15)

Whilst the young Boston Terrier or Miniature Schnauzer always develop total cortical opacitation bilaterally, the Siberian Husky or the Norwegian Buhund develop cataract which seldom involves anterior cortical material, the American Cocker Spaniel may present with bilateral blindness or there may be a unilateral involvement in which the cataract is restricted to a very small part of the lens, it is these characteristics which are so very important in the differential diagnosis of cataract type. (16)

Trauma, prior uveitis, nutritional and age-related changes represent the most important differentials, but pattern and the nature of change are such that diagnostic confusion is only occasionally encountered, the late age at which HC can occur in a breed like the Golden Retriever might began age-related change as the cause, but the involvement of only the posterior polar cortex is not an age change, often the HC of the American Cocker Spaniel is accompanied by lens induced uveitis and here lies the bones of a possible chicken and egg situation, established incidence helps with this possible dilemma, but occasionally opacities are seen which fit no known pattern of inheritance. (17)
Of course cataract surgery has become almost routine due to the introduction of phacoemulsification, so potential restoration of sight is always a possibility, however in general cataract surgery is only

attempted when the eye is rendered functionally blind or there is clear evidence that the developing opacity will involve all or most of the lens cortex, fortunately surgery can offer the individual a chance of useful vision but the control of H.C. needs to be approached as a breed problem. (18)

Symptoms and Signs of Cataracts in Dogs

The term "cataract" refers to cloudiness or opacity of all or part of an eye, this is due to a change in the make-up or arrangement of protein molecules in the lens, cataracts usually are hereditary, but not always, other things that can contribute to cataracts are poor nutrition, low calcium levels, diabetes, electric shock, blunt or penetrating eye trauma and exposure to toxins or radiation, cataracts can show up suddenly or slowly, they are fairly common in old dogs but can be there when a puppy is born or develop early in its life, cataracts always interfere with vision and can cause blindness, however, they don't seem to be painful and won't affect a dog's overall health, dogs usually adjust surprisingly well to having cataracts, fortunately, most cataracts are treatable with surgery, if they are diagnosed early enough in the course of the disease.(19)

Cataracts in dogs are different from nuclear sclerosis, they do affect dog's vision and, untreated, can lead to blindness, dog may be losing vision without realization it since dogs are very good at adapting to vision loss, it's important to have regular eye check-ups throughout his life, as with most other dog health problems, early diagnosis and treatment are best. (20)

Cataracts in dogs can be recognized by the following symptoms:

• Dog's eye lens appears to have a white or crushed ice appearance.
•Dog displays signs of blindness or loss of vision.
•In canines, cataracts are usually inherited and are passed down from parents to offspring, there are certain breeds that are more prone to this condition than others including: Afghan Hounds, American Cocker Spaniels, Bichon Frises, Boston Terriers, German Shepherds, Golden Retrievers, Labrador Retrievers, Miniature Schnauzers, Old English. (21)

Prevention of cataract in dogs

In dogs, cataracts typically have a strong hereditary component, other contributing causes include nutritional deficiencies, low blood calcium levels, exposure to toxins, diabetes mellitus, radiation, electric shock and blunt or penetrating trauma, cataracts can occur spontaneously for no known reason, the actual biological cause of cataracts is a change in the protein composition or arrangement affected eye, the only truly effective way to reduce the prevalence of cataracts.(23)

the fibers of the lens of the The best prevention for cataracts in dogs is to make sure the dog has regular check-ups with the veterinarian throughout his life, there is no specific prevention for cataracts, but good veterinary care can prevent other dog health problems which may lead to cataracts, regular check- ups, including eye exams, will detect early changes in the dog's eyes, early detection is always the best way to prevent and treat any potential problems. (24)

While cataracts always affect a dog's vision, they do not affect its health, most dogs adjust to their vision deficiencies extremely well, surgical treatment for cataracts is highly successful, and the prognosis for dogs with cataracts is excellent if the condition is identified and treated early. (25)

The chief complaints by owners of dogs with cataracts are cloudy, white-ish or blue-grey pupils (or spots in the pupil) and impaired vision, cataracts can occur in one eye, as is usually the case when cataracts are caused by injury, or they can occur in both eyes, cataracts can appear suddenly, or they can develop slowly over a period of years, the cloudiness of the lens may have a crackled appearance, or it may look like a chip of ice, the cataract may appear as a bluish-grey haze over the entire pupil, or only over a part of it, cataracts will always affect a dog's vision, depending on the severity of the cataract, affected dogs will display a range of vision problems from mild to complete blindness, some of the signs associated with reduced vision include a high-stepped walk, unsure footing, tripping over or bumping into objects, walking into walls, misjudging distances and not recognizing people. (26)

Dogs at Increased Risk

Older dogs develop cataracts more often than younger dogs, although dogs of any age are at risk, dogs suffering from diabetes mellitus also tend to develop cataracts more frequently than other animals, breeds with the highest prevalence of cataracts include the Smooth Fox Terrier, Havanese, Bichon Frise, Boston Terrier. (27)

Initial Evaluation

As a dog enters the clinic or examination room, observation should be taken to notice how the dog walks to look for any obvious signs of vision difficulties, the initial work-up will include an evaluation of pupil size and symmetry and an assessment of the dog's pupillary light reflexes, and to check the "menace reflex" by moving one hand swiftly toward the dog's face, then stopping abruptly, checking for a blink reaction, another test frequently done to detect vision deficiencies is to throw a cotton ball onto the floor while watching to see if the dog follows the movement, blood and urine glucose levels will likely be assessed as well, to determine whether diabetes mellitus is a contributing factor to the dog's vision problems. (28)

Diagnosis of cataract

The eyes should be examined using an indirect ophthalmoscope and a slit lamp biomicroscope, bloodwork should be run to make sure there are no undiagnosed causes for the cataracts (such as diabetes), then a ERG test will be conducted to evaluate the retinal function behind the cataract, other diagnostic examinations may be run depending on the severity of the cataracts, these tests will allow to decide on a treatment option for the pet.(29)

Diagnostic Procedures

The intraocular pressure of the eyes will be assessed to rule out glaucoma, assuming that intraocular pressure is normal, then the pupils should be dilated and use a penlight the nature and extent of the cataract and to evaluate for possible concurrent uveitis, anesthetic drops are

normally applied to the eyes before these tests to ensure a painless examination and accurate test results. (30)

other light source to characterize Other tests that commonly used to diagnose eye conditions include the Schirmer tear test and staining the eye with a fluorescein dye, these two tests are used to check the moisture level of the eye, look for foreign bodies and determine whether damage to the cornea has occurred, advanced testing may include ocular ultrasound and electroretinography to evaluate the retina and rule out concurrent retinal degeneration, these tests are usually performed if surgery is anticipated.(31)

The first part of the diagnosis involves a physical examination to determine difficulty walking and external changes in the dog's eye, and also to check the dog's ability to focus on objects, the most common test conducted is known as the Schirmer Tear Test, this involves placing a tear test strip on the lower eyelid to measure tear production, the test is the least invasive, and takes a minute to perform, as well as it is important to examine the eye for damage and the presence of any foreign particles.

Other Diagnostic Tests Include:

- Eye pressure test
- Internal examination of the eye len
- Complete blood count test
- Electroretinography
- Ophthalmic ultrasounds (32)

Internal Examination of the Eye Lens

Dogs will be checked using a specific examination called a slit beam biomicroscopy, a tool is used to magnify the macroscopic and microscopic features of the eye, this includes the examination of eye opacity, fluid retention and the anterior chamber of the eye.(33)

Complete Blood Count Test

Several dogs suffer from cataracts as a secondary disease to diabetes mellitus, the blood test determines all components of the pet's blood work, if uveitis-induced cataract is suspected, moreover, a complete blood count is necessary before any eye surgery is performed.(34)

Electroretinography and Ophthalmic Ultrasounds

Electroretinography is usually conducted to rule out retinal disease, it works to measure the electrical activity in the pet's retina, an ophthalmic ultrasound may also be necessary to determine the shape and composition of the canine eye before eye surgery is conducted.(35)

Treatment for Cataracts in Dogs

The most common and successful treatment for canine cataracts is surgery, which usually means the removal of the dog's clouded lens, however, in some cases other courses of treatment before trying surgery may recommend, if infection or toxins are present, for example, treatment for these dog health problems may improve the cataracts problem, in some cases, treatment with medicinal eye drops can help some dogs, nevertheless, surgery remains the most frequently used treatment, the success rate with this surgery is 90-95 percent, provided the dog is a good candidate for surgery.(36)

Diabetic dogs may be treated surgically, provided they have been correctly regulated for several months, dogs need to have a temperament that will allow them to accept eye drops and medication after surgery and they may need to wear an Elizabethan cone for a short time, the dog also needs to be in generally good health to come through the surgery well, the surgery can restore dog's sight to normal vision.(37)

Treatment Options

Dogs with uveitis (inflammation of certain interior structures of the eye) should be treated with topical anti-inflammatory medication, but the only effective treatment for cataracts is surgery, a thorough eye examination is important, because cataracts can progress rapidly, short of blindness, cataracts can progress to glaucoma and to retinal detachment, at which point surgery may no longer be a viable treatment option.(36)

The only realistic treatment for dogs with impaired vision due to cataracts is surgery, the goals of surgery are to restore vision and hopefully prevent the common secondary sequellae of cataracts, which are uveitis, glaucoma and retinal detachment, the prognosis for dogs undergoing surgical removal of cataracts is better if it is done early in the course of cataract development, of course, that the dog is otherwise systemically

stable and healthy prior to surgery, for example, dogs suffering from diabetes mellitus should have that disorder controlled and their blood glucose levels normalized before having surgery for vision problems, however, it is particularly important to remove cataracts associated with diabetes mellitus, because those cataracts can cause rapid deterioration of vision and ultimately blindness if left unchecked.(38)

Cataract surgery usually requires preliminary ophthalmic ultrasound and an electroretinogram to check whether the posterior part of the eye is normal, then will remove the cataract through a procedure called phacoemulsification, which involves ultrasonic fragmentation of the lens itself, this is followed by implantation of an artificial lens to restore normal vision. Without this artificial lens, dogs will be extremely farsighted after cataract surgery, with little useful remaining vision, after surgery, the dog may be placed on exercise restriction for several weeks, may need to wear an Elizabethan (cone) collar and may also be given topical antibiotics and anti-inflammatory medications, sometime longterm, if cataract surgery is not performed, the cataracts should be monitored frequently for progression, if the condition causes total or near-total vision loss (often with accompanying pain), surgical removal of the eye (enucleation) may be advised.(39)

The standard cataract surgical procedure is typically performed in either a hospital or in an ambulatory surgery center, the most common form of cataract surgery today is a process called phacoemulsification, with the use of an operating microscope and make a very small incision in the surface of the eye in or near the cornea, a thin ultrasound probe is inserted into the eye that uses ultrasonic vibrations to dissolve (phacoemulsify) the clouded lens. these tiny fragmented pieces are then suctioned out through the same ultrasound probe, once the cataract is removed, an artificial lens is placed into the same thin capsular bag that the cataract occupied, this intraocular lens is essential to help eye focus after surgery.

There are three basic techniques for cataract surgery:

- Phacoemulsification: This is the most common form of cataract removal, in this most modern method, cataract surgery can usually be performed in less than 30 minutes and usually requires only minimal sedation and numbing drops, no stitches to close the wound, and no eye patch after surgery.

- Extracapsular cataract surgery: This procedure is used mainly for very advanced cataracts where the lens is too dense to dissolve into fragments (phacoemulsify) or in facilities that do not have phacoemulsification technology, this technique requires a larger incision so that the cataract can be removed in one piece without being fragmented inside the eye, an artificial lens is placed in the same capsular bag as with the phacoemulsification technique, this surgical technique requires a various number of sutures to close the larger wound, and visual recovery is often slower, extracapsular cataract extraction usually requires an injection of numbing medication around the eye and an eye patch after surgery.

- Intracapsular cataract surgery: This surgical technique requires an even larger wound than extracapsular surgery, and the removes the entire lens and the surrounding capsule together, this technique requires the intraocular lens to be placed in a different location, in front of the iris, this method is rarely used today but can be still be useful in cases of significant trauma.(40)

As the natural lens plays a vital role in focusing light for clear vision, artificial-lens implantation at the time of cataract surgery is necessary to yield the best visual results, because the implant is placed in or near the original position of the removed natural lens, vision can be restored, and peripheral vision, depth perception, and image size should not be affected, artificial lenses are intended to remain permanently in place, require no maintenance or handling, and are not felt by others, there are a variety of intraocular lens styles available for implantation, including monofocal, toric, and multifocal intraocular lenses.

1. Monofocal lens: These lenses are the most commonly implanted lenses today, they have equal power in all regions of the lens and can provide high-quality vision at a single focal point, they usually require only a light pair of spectacles for optimal distance vision correction, however, monofocal lenses do not correct astigmatism, an irregular oblong corneal shape that can distort vision at all distances

2. Toric lens: Toric lenses have more power in one specific region in the lens (similar to spectacles with astigmatism correction in them) to correct astigmatism, due to the difference in lens power in different areas, the correction of astigmatism with a toric lens requires that the lens be positioned in a very specific configuration, while toric lenses can improve distance vision and astigmatism.

3. Multifocal lens: Multifocal intraocular lenses have a variety of regions with different power within the lens that allows individuals to see at a variety of distances, including distance, intermediate, and near, while promising, multifocal lenses may cause significantly more glare than monofocal or toric lenses, further, multifocal lenses cannot correct astigmatism, and some patients require additional surgery such as lasik to correct astigmatism.(32)

Potential complications of cataract surgery

While cataract surgery is one of the safest procedures available with a high rate of success, rare complications can arise, the specific potential complications of the procedure that are unique to the eye prior to having sign a consent form, the most common difficulties arising after surgery are persistent inflammation, changes in eye pressure, infection, or swelling of the retina at the back of the eye, and retinal detachment, if the delicate bag the lens sits in is injured, then the artificial lens may need to be placed in a different location, in very rare cases, the intraocular lens moves or does not function properly and may need to be repositioned, exchanged, or removed, all of these complications are extremely rare but can lead to significant visual loss if left untreated; thus, close follow-up is required after surgery.(33)

Prognosis

Without treatment, most dogs with cataracts will lose vision in the affected eye. With surgical correction, 90°o to 95% of dogs will have their vision restored successfully. Early diagnosis and treatment are of course very important to the outcome for each affected animal.(34)

Treating cataracts without surgery

One of the heartbreaks that happen as animals age is the development of cataracts, this is much more common in dogs than in cats, when it gets to the point that the animal can no longer see, traditional medicine says the only thing they can do for it is surgery to remove the cloudy lens, the surgery is expensive and may be difficult, the chances of helping an

animal with surgery is even less if the animal has shown up at a rescue group, for these situations it has just been accepted that the animal was blind.(40)

There are non-surgical ways of treating cataracts that can help and often times restore the vision to the animal,

Sedum praealtum

A nonsurgical treatment of opacities of the lens and of the cornea of the eye is reported. The method presently employed is by applying 0.05 cc of Sedum praealtum leaf-extract on the surface of the eye. Significant results are a complete recession of the opacity. no serious subsequent irritation due to the treatment and most important, no observable tendency for the opacity to re-occur.

MSM and Flaxseed oil

MSM(Methonyl-Sulphur-Methane)

MSM is an organic source of sulphur, which amongst its many other properties has been shown to be important for collagen and connective tissue, it works on the bonds between the molecules which constitute these cells, MSM has also an important role to play in relieving inflammatory conditions such as seasonal or allergic rhinitis and may help with symptoms such as streaming eyes, Flax-Seed-Oil apart from being a rich source of Omega 3 Fatty Acids, flax contains the antioxidant nutrient beta carotene, carotenoids and Vitamin E. this treatment would be “safe for any mammal.” it need a couple of eye droppers, some saline solution or a very mild eye drop, pure MSM with no additives, and cold pressed flaxseed oil, on the flaxseed oil, you want to make sure it is the cold pressed that you get from the refrigerated section, the cold pressed to insure that in the process of getting the oil, it has not been altered in any way, flaxseed oil is easily affected by heat and light, the bottles that are in the cooler are dark to prevent the light from affecting it, in addition, the cold pressed oil is to be the most effective.(30)

By itself, flaxseed oil is regularly used for eye health, it has been found as effective for treating dry eye as the medication doxycycline, for dry eye it is taken internally, 1 tablespoon a day.(40)

Mix the MSM into the saline solution so that it comes out to be a 15% solution, this is basically 1 teaspoon of the MSM to one ounce of the solution, administration a couple of drops of flaxseed oil directly into the eye, this helps to soften the tissue, after 10 to 30 minutes administer a couple of drops of the MSM solution to the eyes, there may be some uncomfortable stinging with the drops, but it is very temporary and not real uncomfortable. That is part of why you want to make sure the MSM is mixed into a soothing solution, administer the flaxseen oil followed by this solution several times a day, after about 4 days start to appear a white substance in the comer of the eye, that is the material from the cataract, continue with the treatment until there is no more sign of the cataract, without the flaxseed oil the MSM is not as effective and it takes a much longer time to get rid of the cataract.(39)

For the first time, oxysterols accumulate in human cataracts, although the total amount of oxidized cholesterol in cataracts is not likely to be high it may account for much of the membrane damage associated with cataract formation, eyeball as a balloon full of water, but instead of being tubber, it is a protein membrane, optical tissue normally allows fluids to flow through the membrane wall which acts like a filter, cleaning out harmful particles, keeping eyes clear and vision good as it allows nutrients to permeate, but should the membranes become tough like leather, the fluids are trapped and particles begin to accumulate, if this buildup continues, vision will seem as looking through frosted glass, a condition known as cataracts. (38)

When eyedrops containing the proper amount of MSM are applied, the membrane becomes permeable, and this has reversed the problem, it is also important that the eye remain flexible so that the muscles can alter its contour and focus as needed, in the event that its membranes and muscles become rigid and tough, the eye will not be able to focus properly, resulting in blurred vision, the MSM in eyedrops soothes and softens the membranes, permitting fluids to pass through the optical tissues to stabilize the pressure, repair any damage, clear up red spots and bloodshot vessels, and remove floaters and other particles in the eye, it is apparent that the MSM makes the eye more permeable so that it can get rid of the substance that is causing the cataract, it is also increasing the permeability of the eye for the flaxseed oil, and since it gets rid of cholesterol, it is helping to dissolve the buildup that is the cataract itself, these drops are not useful for the cataract treatment as they are only a 1% solution, and not the 15% that is used.(28)

N-Acetylcarnosine

There is another drug that is widely used for getting rid of cataracts, it goes by many names, Can-C, Bright Eyes, and Ocuphase, all of them have the same basic ingredient - N-acetylcarmnosine, there is some scientific evidence that these drops work:

The eyes treated with NAC were substantially improved in 6 months the measured transmissivity of the lenses increased in 42 percent of the eyes, by 12-50 percent; in 90 percent of the eyes, glare sensitivity improved by 27-100 percent, these improvements were sustained for the duration of the 24-month trial, in no eyes was any worsening of the condition seen, by contrast, the condition of the untreated eyes in the control group worsened, there were two downsides to this method of treating the cataracts — the cost and the time it took to make them better, which takes several months to work.(39)

While it takes 3-4 drops daily over 3 - 12 months to reverse cataract it takes far less to prevent the re-growth of cataract, therefore, once optimal level of reversal has been achieved only one drop daily will prevent the return of cataract, at this point the product will last far longer and so it will be far less expensive to maintain the health of pets' eyes, keep in mind that the same imbalance that allowed the cataract to form in the first place will still be present in the pet if discontinuing use of the product entirely, unfortunately cataract will likely return, in a relatively short period of time, unless n-acetylcarnosine is being applied regularly to the eye.(40)

Homeopathic

There are a couple of homeopathic drops that can also be used:

1. Similasan Cataract Care Eye Drops
2. Cineraria Cataract Eye Drops

According to homeopathic principles, the active ingredients in this medication temporarily relieve symptoms associated with cataracts and aging ... If it has recommended postponing surgery, Similasan's unique Active Response Formula stimulates the eye's natural ability to relive symptoms of cataract, Similasan eye drops provide healthy relief with no known side effects or drug interactions, there were no studies that were

readily available on the effectiveness of these drops. They were much less expensive as opposed to the N-acetylcamosine drops.(37)

Alternative Treatment

There was alternative treatments:

1. Eucalyptic Honey - Apply a small dab inside the lower eyelid once a day with the blunt end of a toothpick, or put one drop in each eye with an eyedropper, the process takes several weeks.

2. Eyebright tea (not tincture) — Used internally and as an eye drop.

3. Greater Celandine Tea — Use twice daily as an eyewash.(33)

As with all things it is much better to prevent cataracts than to have to

treat them at a later date, a good wholesome dict is the first start,

this with antioxidants, especially Vitamins A and E, a lot of

bright light is thought to be a factor in producing cataracts, some

medications and health issues are also associated with this eye condition,

frequent use of steroids and diabetes both come to mind, and make sure of getting a lot of antioxidants to help counteract the conditions,

An older dog it is probably quite familiar with cataracts, any dog that is lucky enough to become a senior is in all likelihood going to get them. Cataracts cause a clouding over the lens of the eye, which blurs vision and can potentially cause blindness if not treated. The standard treatment to remove them is with surgery, which can be costly.(40)

Conclusions

- Cataract in dogs can happen due to proceeding in age or in prolonged administration of steroids or may accompany specific diseases like diabetes mellitus.

- Treatment of cataract may vary from medical to surgical intervention.

- Surgical treatment of cataract in dogs is the best one with returning to normal vision.

- Medical treatment can help to prevent cataract progression with no noticeable complications.

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