CLINICAL ASPECTS OF OPHTHALMOLOGY IN CAGED BIRDS

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INTRODUCTION

Very little has been written about ophthalmologic disorders in birds. This paper attempts to document some of the ocular problems of caged birds with descriptions and disease course, and when possible, etiology and treatment. It becomes obvious that this is just the beginning of a truly fascinating field of study.

ANATOMY

The shape of the avian eye varies from species to species. The anatomic differences compared to mammals are: 1. striated musculature of the iris and the ciliary body; 2. scleral ossicles; and 3. the pecten.

The musculature of the iris and ciliary body in birds is striated rather than smooth; therefore, dilation for ophthalmoscopy or in the therapeutic regimen cannot be achieved by application of parasympatholytic drugs (e.g. atropine, tropicamide). Skeletal muscle paralyzing agents must be used. A dry crystalline preparation of d-tubocurarine in 0.025% benzalkonium chloride to create a 3 mg/ml solution is effective in some species. Commercially prepared aqueous solutions of tubocurarine do not readily pass through the corneal layers.

The anterior sclera of birds contains 11 to 15 sclerotic plates. The ossicles contribute to shaping the globe and provide an anchor for the ciliary muscles. They are clinically important when enucleation of the eye is indicated.

The bird has a true anangiotic retina (avascular), but they do possess a pecten, a heavily pigmented, highly vascular, pleated structure extending from the optic disc into the vitreous. Ultrastructurally the pecten capillaries resemble those of organs with secretory function, like the ciliary body of mammals, and indicate that the pecten may be a producer of intraocular fluid.

FIGURE 1

	Mammalian	Avian
Eyelashes	Cilia	Filoplumes
Musculature of iris and ciliary body	Smooth, involuntary	Striated, somewhat voluntary
Sclera	Fibrous	Fibrous with ossicles
Retinal Vasculature	Variable	Avascular with pecten

EXAMINATION

Chemical restraint may be necessary for complete ocular examination. Ketamine in combination with a topical ophthalmic anesthetic is sufficient for most procedures. Ketamine does not cause consistent pupillary dilation in birds. Therefore, topical muscle paralyzing agents may be necessary for examination of the posterior pole.

In a laterally recumbent bird which is under ketamine anesthesia, the anterior chamber of the down eye may collapse. The eye returns to a normal appearance within a few minutes after repositioning. Recovery areas should be padded to prevent periocular bruising which may occur due to head tossing.

Iris color should be noted since in many species it may be an indication of age or sex. Fledgling macaws (Ara sp.) have brown irides which fade to grey within the first year. Between one to three years the irides appear white and turn yellow as the bird matures. Young amazon parrots (Amazona sp.) have brown irides which become red-orange as they age. Iris color in African grey parrots (Psittacus erithacus) changes from brown, through grey, to white. Many species of cockatoos (Cacatua sp.) show sexual dimorphism in iris color. The adult males have dark brown to black irides, while the adult females have red irides. The young of both sexes have brown irides.

GENERAL EYE PROBLEMS SEEN IN BIRDS

Most acquired ocular disorders diagnosed in mammals are recognized in birds. Dermoids, birth defects of the cornea, occur sporadically. One case of unilateral dermoid was observed in a cockatiel. The dermoid contained a single filoplume lash.

Uveitis, with lowered intraocular pressure, steamy cornea, hyperemic iris, and aqueous flare, is seen unilaterally or bilaterally and may be a reflection of some systemic disease. Hypopyon, which is thick, cellular material in the anterior chamber, may result. Adhesions of the inflammed iris to the lens or cornea, known as synechiae, are common sequellae. Uveitis in birds is treated with topical steroids. Topical preparations, to be effective, should contain dexamethasone or 1% prednisolone.

Corneal damage may take the form of an abrasion, an infectious ulcer or a laceration. Corneal ulcers in birds are treated with topical antibiotics. Cycloplegics, commonly used in mammals are of no therapeutic value. Physical debridement of loose epithelium with a dry cotton tipped applicator may hasten healing Mucomyst (10%) should be used topically in conjunction with antibiotics in the treatment of deep corneal ulcers. This collagenase inhibitor can be applied as a drop or with less stress as an ocular spray every few hours. Many corneal ulcers will result in relatively permanent, clinically insignificant, corneal

crystals. Severe corneal lacerations should be repaired surgically.

Trauma may result in hyphema, blood in the anterior chamber, usually originating from the iris or ciliary body. Steroids are indicated to minimize any intraocular reaction as this clears.

Cataracts are seen sporadically, especially in older birds, but also as a result of injury or previous intraocular inflammation. When indicated, cataracts may be removed surgically. Phacoemulsification, when available, allows lens removal through a small incision with the ability to leave minimal lens debris.

Primary neoplasia of the eye and adenexa is rare in birds. Orbital sarcoma, glioma of the optic nerve, lipogranuloma of the eyelid and thrichoepithelioma of the eyelid have been reported.

SPECIFIC EYE DISEASES FOUND IN BIRDS

Avian Pox

Avian pox virus infections occur in a wide variety of species of birds. They are divided into five subgroups of poxvirus avium: fowl, pigeon, turkey, canary, and parrot.

Newly imported parrots from South and Central America are often infected with pox. In most cases the disease has run its course by the time the bird reaches the individual pet owner. However, many cases may result in scars or chronic ophthalmic problems for which veterinary care may be requested.

Two forms of pox are clinically recognized. The mild dry form rarely affects the eyes and will not be discussed. The severe wet or diphtheritic form can result in a variety of eye problems as well as systemic disease. References are provided to give you further information on the systemic manifestations of parrot pox.

The eye lesions of parrot pox are most often seen 10 to 14 days post infection and are usually the first lesions observed. These are usually unilateral but may be bilateral. The first signs observed are mild blepharitis and a clear serous ocular discharge. The lids swell and paste together. Caseous white masses and fluids collect under the lids. The cornea becomes edematous and ulcerated. These ulcers may become chronic and may perforate. At 12 to 18 days post infection, dry crusty scabs form around the margins of the lids and may completely seal the lids shut. These scabs progressively get leathery in texture and subsequently dry and fall off. Clinical illness lasts 2 to 6 weeks.

Microscopic lesions are characterized by epidermal hyperplasia, consisting of ballooning degeneration, intraepithelial

vesicles and eosinophilic cytoplasmic inclusions (Bollingers bodies). These lesions are seen at the lid margins, including the follicles of the filoplume lashes and larger areas on the outer surface of the lids. Brick-shaped pox virons can be fou in inclusion bodies by electron microscopy.

Many of the birds that do recover will suffer residual effects. Distorted lids, loss of periocular pigmentation and filoplume lashes, subepithelial corneal crystals, and chronic corneal ulcers are common. Chronic tearing may occur due to damage to the lacrimal drainage apparatus. In some cases the may be lost due to perforated ulcers or panophthalmitis.

Treatment is aimed at secondary infection and providing supportive care. Vitamin A has been clinically effective in decreasing severity of the infection if given prior to the ons of lesions or in the very early stages of the disease. After appearance of eye lesions the Vitamin A is much less effective. Systemic antibiotic therapy is often necessary for the treatme of secondary bacterial infections.

Eye lesions are routinely treated with mercurochrome solu· tion followed by the application of chloramphenicol ophthalmic ointment. The mercurochrome eye wash is prepared by adding on ounce of 2% mercurochrome to 4 ounces of eye wash solution. After formation of the scabs, the eye can be treated by gently lifting one side of the scab, just enough to medicate the eye. Scabs should not be removed due to the potential damage that t would cause to the lids. Far less damage will occur if the sc are allowed to drop off naturally. The most common secondary bacterial invaders are E. coli, Pseudomonas and Proteus. Fung infections (Candidiasis and aspergillosis) often occur in the secondary to pox.

Eye lesions due to avian pox infections may also be seen canaries, birds of prey, pigeons and gallinaceous birds. Trea ment of pigeon pox lesions is similar to that of pox in parrot In canaries, individual treatment may be impractical both due their size and due to the very high mortality rate. Antibioti preparations sprayed into the eyes may be helpful. Pox infec- tions in birds of prey in the United States are usually self- limiting and cause relatively little damage. Topical treatmen of the lesions however may be helpful.

Cockatiel Conjunctivitis

Cockatiels (Nymphacus hollandicus), especially the white albino mutation, are very often afflicted with a conjunctiviti of unknown etiology. It has often been speculated that this syndrome is caused by mycoplasma; however, despite repeated isolation attempts, this has not been confirmed.

The condition begins with mild blepharitis and serous ocular discharge. The conjunctivae become inflamed and begin to swell at the medial canthus. The conjunctival vessels become engorged and the conjunctiva protrudes from under the lids. If allowed to progress the tissue will become infiltrated. This conjunctivitis is often associated with upper and lower respiratory infections. Nasal discharge, plugged nares, sneezing, coughing and dyspnea may be observed.

As with many mycoplasma infections, this disease tends to become chronic. The eye lesions are easily treated and respond to a variety of antibiotic ophthalmic preparations with or without steroids. Recurrence, however, is common. Systemic therapy with tylosin, either by addition of tylan to food and water supplies in flocks or by IM injection in individual birds, may be helpful. Eye lesions are treated by spraying the eyes with tylosin (tylan powder) mixed 1:10 with water. Birds can easily be treated several times daily with minimal stress. Surgical removal of the infiltrated material in chronic cases has not been rewarding.

There is some evidence that this disease may be transmitted to offspring, so infected birds should not be used as breeders.

Lovebird Eye Disease

This disease of unknown etiology has been observed only in lovebirds (Agapornis sp.) and is more severe in mutation lovebirds than in the wild types. It is most often observed in peachface mutations (A. roseicollis sp.). Other species are affected but to a lesser degree. This disease is a severe and highly fatal systemic disease which has a concurrent ocular manifestation. The first signs of the disease are depression, blepharitis, and a slight serous ocular discharge. As the disease progresses, the lids become hyperemic and swollen and the ocular discharge becomes more severe. Weight loss and severe depression ensue. If kept in a flock, an affected bird is often assaulted by cage mates. Death usually occurs within a few days after the appearance of lesions.

Gram positive cocci are consistently isolated from these eyes but are not thought to be of etiological significance. Several attempts at virus isolation have been unsuccessful. Treatment has been unrewarding. The birds fail to respond to every antibiotic which has been tried to date when given systemically, topically in the eye, and in combination.

The disease does seem to be stress related and birds will often develop symptoms 1 to 2 weeks after a stress such as shipping. The only measure which has been helpful in the management of the disease is placing the birds in a non-stressful environment and using no treatment. This syndrome has only been observed in captive bred birds.

Mynah Eye Disease

Three distinct eye problems have been observed in mynahs (Gracula sp.). They may be unrelated or may be different stages of the same disease.

1. Corneal scratches following shipping - Mynahs move around excessively in a shipping crate and tend to scratch their cornea In one study, 96 of 100 birds examined after shipping were affected. In most cases, the cornea will re-epithelialize withi 24 hours without treatment.

2. Keratitis - This is usually observed within a week following shipment. Lesions range in severity from corneal bedewing to complete corneal opacity. Most cases regress spontaneously with in weeks, but some may persist several months. No accompanying systemic disease has been observed. Therapy does not seem to affect the course of the disease. Scarring of the cornea may result in severe cases.

3. Chronic Keratoconjunctivitis - This disorder is often associ ated with the keratitis syndrome. A large mass of infiltrated conjunctiva can be found under the lower lid. In order to see this tissue the lid must be everted. The entire cornea is ofter ulcerated. Vasculaturization of the cornea may occur with chronicity. Surgical removal of the redundant tissue and topica antibiotic therapy often results in at least temporary resolutic of the ulcers.

Rhinitis and Sinusitis

Upper respiratory inflammation is often accompanied by conjunctivitis and ocular discharge. Although the initiating cause may be chlamydial, viral, mycoplasmal, or bacterial, other factors are also important in the initiation of upper-respiratory disease including hypovitaminosis A, chills, irritating fumes or a dusty environment.

Many cases respond favorably to treatment with Vitamin A and systemic and topical antibiotics. Some chronic cases may result in the accummulation of caseous material under the eyelids and in the sinuses. Alleviation of the sinusitis or rhinitis will in most cases alleviate the ocular problems.

For a more complete discussion of sinusitis and its therapy refer to Diseases of Cage and Aviary Birds, Second Edition, Margaret L. Petrak, Ed.

Chronic Conjunctivitis in Amazons

Chronic conjunctivitis may be associated with upper respiratory infections in amazons. Conjunctival tissue may become edematous, inflamed, and infiltrated. Topical steroids or

surgical removal of excessive conjunctival tissue may be helpful. Chronic or intermittent corneal ulcers may accompany this chronic conjunctivitis.

Periorbital Abscesses

A possible sequella to chronic upper-respiratory disease is periorbital abscess. This is most often seen in cockatiels and may occur above or below the orbit. Abscesses are much less likely to occur in sinusitis cases which are treated with antibiotics in the early stages. They are much more common in the pet bird whose owner fails to notice the symptoms of sinusitis for a period of time. Surgical removal of caseous material and the use of systemic antibiotics is indicated. Caseous masses above the eye, which are not too large, may be successfully removed through the conjunctiva resulting in faster healing and less lid distortion.

Lacrimal Sac Abscesses

Lacrimal sac abscesses are often confused with periorbital abscesses. The etiology is unknown; however, they usually accompany or follow cases of sinusitis in psittacine birds. They are presented as a swelling anteroventral to the medial canthus. The swelling is usually movable and hard. If pushed toward the eye, caseous material can usually be seen in the lacrimal punctum, which is usually enlarged. In mild cases, the material may be removed simply by expressing it gently out of the lacrimal punctum. In more severe cases, cannulation of the punctum may be required to break up the caseous material so that it may be flushed out or removed in pieces with a pair of fine ophthalmic forceps. Daily flushing with rather large volumes (2 to 10 ml) of saline may be required to remove the caseous material. Appropriate antibiotics may be included in the saline flush. In severe cases, some distortion of the lids, with or without chronic epiphora, may occur. Surgical removal is not recommended except in the most severe cases due to the potential for spread of the infection and excessive scarring of periorbital tissues.

Sunken Eyes and Sinuses in Macaws

A peculiar sinusitis which has been observed only in macaws results in sinking of the eyes into the orbit. In very severe cases, the eye may recede far into the orbit and move ventrally so that the pupil is bisected by the ventral rim of the orbit. It is often accompanied by collapse of the tissues over the sinuses.

A thick, copious, mucoid to muco-purulent material is contained within the sinuses and may be discharged from the nostril. A mucoid discharge may also collect under the lids and drain from the eye. Caseous material may form in the choanal cleft. Culture usually reveals E. coli, Klebsiella, or Pseudomonas. In one

yellow collared macaw (Ara auricollis) a pure culture of Hemophilus was obtained on post mortem.

Despite the terrible appearance of this disorder, it is ver responsive to therapy. These birds are routinely treated with gentamycin or amikacin. The sinuses must be flushed daily with large volumes (10 to 30 ml in each nostril) of saline mixed with the appropriate antibiotic. The sinuses are flushed by insertin the end of a syringe into the nostril and gently pushing the solution through the sinuses and out the choana. The bird can b held to the side or upright. In some cases fluids may emerge from the nasolacrimal duct into the eye. Topical antibiotic ophthalmic preparations are helpful in the treatment of accompan ying conjunctivitis. Recovery is usually complete with two week of vigorous treatment.

Scarlet (Ara macao) and greenwing macaws (Ara chloroptera) are most often affected and respond well to treatment. The condition in miniature macaws, especially yellow collared macaws, i more likely to become chronic. A similar condition observed in amazons is usually not responsive to therapy and may be unrelate

Punctate Keratitis in Amazons

A mild transient punctate keratitis has been observed in amazons imported from Central America. The first signs are mild blepharospasm and serous ocular discharge. The lesions are most often bilateral.

The lesions appear first as a slight irregularity of the medial cornea. In many cases, this will resolve spontaneously within a week. In approximately half of the cases, the lesions will progress over the surface of the cornea. Transient superficial staining with fluorescein may be observed at this time. There may be concomitant anterior uveitis (aqueous flare, iritis fibrin deposits in the anterior chamber). Anterior or posterior synechia may result. Fewer than 5% of these birds will develop deep corneal ulcer. As the disease progresses, some birds will develop sinusitis.

Most cases will regress spontaneously within 1 to 2 weeks. Treatment of the superficial eye lesions has been attempted with a variety of topical antibacterial, antiviral and chemical preparations. No treated group has shown a significant improvement over untreated controls.

Treatment is recommended for cases which develop a mucoid or muco-purulent nasal discharge, deeply staining corneal ulcers or uveitis. Therapy in sinusitis should be aimed at secondary invaders and the provision of adequate levels of Vitamin A. Uveitis should be treated with a topical antibiotic-steroid ophthalmic preparation. Systemic antibiotics may be indicated. Mild residual blepharospasm may be evident for several weeks.

Hereditary Cataracts in Canaries

Slatter, et.al., reported on hereditary cataracts in a breeding group of Yorkshire and Norwich canaries (Serinis canarius) in which excellent longterm pedigrees were available. The birds were presented with gradual onset of crash landing followed eventually by refusal to move from the perch. Mature bilateral cataracts were observed in all of the 6 birds examined. After studying the pedigree of the Yorkshire canaries, which included 7 generations over 15 years, they hypothesized that the syndrome was produced by a fully penetrant recessive allele at an autosomal locus.

OCULAR PARASITIC DISEASES

Cnemidocoptes pilae

Cnemidocoptic mites cause lesions (scaley face) of the cere and periorbital area in budgerigars and occasionally other species. Historically the condition has been treated with a variety of topical acaricides; however, application of these compounds around the eyes often leads to irritation, and repeated application for a number of weeks is required. It can now be very effectively treated with a single IM dose of avermectin (200 ug/kg). Very extensive or severe infections may require a second dose.

Oxyspirura mansoni

Oxyspiruria mansoni is a small, slender nematode which may be found behind the nictitating membrane or in the conjunctival sac and lacrimal duct. It commonly occurs in cockatoos and has been reported in domestic poultry, mynahs, house sparrows, and doves.

Following instillation of a topical anesthetic, worms can be found by lifting the nictitating membrane. In heavy infestations, the eye lids may appear swollen or distended and the bird may scratch at the eye.

Light infestations result in little or no discomfort to the bird and treatment is not warranted. Worms can be removed manually, but many will escape into the lacrimal duct. Worms will die after treatment with avermectin and frequent washing of the eye is required to remove the decaying worms.

SURGICAL PROCEDURES

Suturing the external eyelids is an easy and effective alternative to third eyelid or conjunctival flaps in birds. One horizontal mattress suture of small diameter, non-absorbable material on a small cutting needle is usually all that is necessary. Third eyelid flaps are not recommended due to the intrinsic muscular control of the nictitans.

Enucleation in birds is a disfiguring procedure because of the relatively large volume of the globe. A transconjunctival approach is used and care must be taken to minimize traction and trauma to the optic nerve, which is short and close to the optic chiasm. Excessive trauma in the posterior pole of one orbit may affect the optic nerve of the other, resulting in contralateral blindness.

Evisceration of the ocular contents is preferable. The cornea is removed and the intraocular contents are teased free and removed. The conjunctiva is closed over the globe with small diameter absorbable sutures. The eyelid borders are trimmed close to their margins and then sutured edge to edge with fine diameter non-absorbable sutures.

Removal of exuberant granulation tissue from the conjunctiva in mynahs can be done with the bird under ketamine anesthesia with the addition of a topical anesthetic. The base of the tissue to be removed is carefully crushed with Allis tissue forceps and cut with small scissors along the indicated line. Bleeding is minimal and suturing is not required.

A lacrimal sac abscess may sometimes require surgical drainage, but repeated flushing may be adequate. Birds have an upper and a lower naso-lacrimal punctum. Each is easily visible with magnification. Topical anesthesia is required for flushing. A nasolacrimal cannula may be used. Alternatively, the plastic portion of a feline indwelling intravenous catheter is used. It is pliable and blunt enough to reach the deep recesses of the expanded sac and to disrupt the inspissated material. Sterile saline with or without an appropriate antibiotic is used as the flushing solution. In cases that can not be flushed and in periorbital abscesses, surgical removal of the material is indicated.

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