

The Geriatric Psittacine Patient

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This article addresses the aging pet psittacine population's geriatric disease conditions. Over the past twenty five years, avian husbandry and medicine have undergone drastic changes, including a significant increase in domestically raised pet birds and major advances in avian nutrition. Despite the potentially adverse psychological affects of incubator hatching and hand- raising (which is a separate but critical concern), these changes have resulted in birds that are living longer. Just as in human medicine, coping with the process of aging is a necessary consequence of greater longevity.

A list of the more common problems in aging birds follows:

CATARACTS: Cataracts are found in many species of psittacine birds as they age – notably Macaws, Amazons, and cockatiels. It may be that these species are more prone to this disorder or merely that they are over-represented in the older pet bird population.

If the onset of cataracts is gradual, adaptation to the decreased vision usually occurs. Occasionally cataracts will occur very suddenly and the bird has insufficient time to adapt. A literature search did not reveal documentation of correlations between metabolic disease (e.g. hyperglycemia) and sudden onset of cataracts in birds. However, potential concurrent disease should be investigated.

Decreased vision or blindness understandably can frighten a bird, causing it to startle easily. The fear that comes with vision loss can also lead to increased screaming or biting. If the cataract(s) is not noticed, the owner may attribute the bird's altered behavior to other factors.

The eyes should be examined at each annual visit to detect early changes in lens opacity. Due to the small size of the exposed cornea and pupil in pet psittacines, examination of any bird with suspected ocular abnormalities by an ophthalmologist is recommended. In the past five years alone, with in-house access to ophthalmologists, the following additional ocular diseases have been detected in this author's practice when an avian patient presented for a possible cataract: KCS, corneal ulcerations, third eyelid anatomic abnormalities, hypopyon, anterior uveitis, conjunctival granulomas and infectious diseases involving the conjunctiva (Chlamydophila, Mycoplasma, pox virus), cryptophthalmia, Harderian gland adenoma and lymphoma.

Although in smaller birds, there is no treatment for cataracts that will restore vision, other diseases that may be detected by an ophthalmologic examination may have medical treatments and/or may be of significant medical import. In larger psittacines, surgical removal of cataracts is successful in many cases. A bird's general health and the degree to which the cataracts are affecting its quality of life should be evaluated prior to surgery. Commonly used mydriatics are not useful in birds due to the skeletal (as opposed to smooth) muscle found in the iris.

In any bird with decreased vision, minimal alteration of the home environment is critical. The placement of food and water dishes and perches should not be altered if at all possible. If, despite environmental accommodations, a bird with decreased vision or blindness can not be made to feel relatively secure, humane euthanasia may need to be considered.

ARTHRITIS: Septic and traumatic arthritis may occur at any age. Septic arthritis is most commonly noted in the digits of birds. Geriatric onset arthritis occurs in many species, and birds are no exception. Their small size makes radiographic diagnosis difficult. The stifles seem to be the most obviously affected, although coxofemoral joint range-of-motion limitations are common in older birds. The weight of the bird, its general physical condition, any previous injuries, and any concurrent medical conditions can all contribute to the onset and severity of arthritis. Concurrent pododermatitis is often present; likely both a cause and result of decreased activity. Malnutrition, which decreases the integrity of the plantar epithelium, and concurrent obesity are often noted in affected birds. The cage environment, especially the variety, diameter and texture of perches, can be important in providing comfort and stability for arthritic birds, while preventing or minimizing pododermatitis. The nails should be left with sharp points if possible, to add strength and stability to the grip. Wings should not be over-clipped, so they can be used to help with balance. Some medications, such as meloxicam, are being successfully used in birds, as well as acupuncture and other holistic treatments, to decrease the inflammation and discomfort.

ARTICULAR GOUT is also common in birds. Differentiation between arthritis and articular gout is critical due the vast differences in progression, quality of life issues and prognosis. Articular gout is excruciatingly painful, and if the bird can not be made comfortable, euthanasia should be considered.

HEPATIC DISEASE: Poor nutrition is a definite cause of liver diseases in birds of all ages. The function of the liver as a filtering organ makes it susceptible to infection, toxins, dyes, pesticides, heavy metals, and aflatoxins. Older birds often present with clinical signs of chronic hepatic disease, such as an overgrown beak, overly curled nails, lack of powder

down in applicable species, pododermatitis, and poor feather quality. These conditions may not be recognized as abnormal by the owner. It may not be until the liver decompensates and /or succumbs to secondary infection that the clinical signs become sufficiently pronounced for the owner to seek medical assistance. The clinical signs of a bird with active liver disease often include depression, decreased appetite, increased urination, and a discoloration of the urate and fecal portions of the dropping. Biopsy and histopathology of the liver, often reveal fibrosis, cirrhosis, hepatic lipidosis and chronic hepatitis. Supportive care, including antibiotics, lactulose, supplemental feeding, parenteral fluids, and vitamin/nutritional supplements may be warranted.

CARDIAC DISEASE: As our birds live longer and our diagnostics improve, we are detecting a greater incidence of cardiac disease. These can be difficult to detect and may mimic other problems, such as respiratory disease. The bird may present weak, lethargic, and/or with increased respiratory rate and effort. With right sided heart disease, hepatomegaly and ascites are common. Disease may also be sub clinical, then present acutely, with the bird expiring when diagnostics or treatment are attempted. Right heart disease is more prevalent in birds than left-sided cardiac disease, as discussed below.

Pulmonary Hypertension

The avian cardiovascular system differs anatomically and physiologically from mammalian in several parameters. The right A/V valve is a single, muscular valve with no chordae tendinae. Unlike mammals, the physiologic responses that maintain low pulmonary vascular resistance, (both vascular distensibility and vasculature recruitment) are absent in birds.^{1,2,39} Practically, this results in the inability of the pulmonary vasculature to accommodate increased cardiac output by either altering vasculature diameter, or changing the percentage of vasculature channels being utilized. This is, at least in part, responsible for the high incidence of pulmonary hypertension syndrome (PHS) in the poultry industry as well as right-sided heart disease in psittacine patients.

Due to the financial impact of PHS in broiler hens, much research has been conducted in this area. In addition to the lack of vascular accommodation in avian species as noted above, studies have demonstrated that the response to pulmonary arterial hypertension in chickens is an increase in two vasoactive substances, the vasodilator nitric oxide (NO) and the vasoconstrictor serotonin [5-hydroxytryptamine (5-HT)] (5-HT).² The vasoconstrictor 5-HT predominates over the vasodilator NO in broiler hens susceptible to pulmonary hypertension syndrome. For the broiler industry, genetic selection of hens is being investigated. For our geriatric psittacine patients, this indicates that vasodilator therapy in cases of pulmonary hypertension should be explored.

Another potential cause of PHS in birds is the existence of the renal portal shunt, which allows bacteria from the lower GI to enter the general circulation without filtration by the liver. This increased chance of bacterial sepsis may lead to a higher incidence of valvular and thromboembolic disease.

Macaw asthma may theoretically cause pulmonary hypertension, both from chronic air capillary hypoxia and subsequent polycythemia. No published data on pulmonary hypertension in macaws diagnosed with this syndrome was located.

Atherosclerosis is common in psittacine birds.^{1,20, 39} It is generally a geriatric condition, with the exception of African Grey parrots, in which this disease has been noted with some frequency in very young animals. Radiographically, the right aortic arch may be enlarged with increased density. Lipemia is often noted, and marked elevations in cholesterol and triglycerides may be seen. Unfortunately, definitive ante mortem tests are lacking. At necropsy, grossly thickened arterial walls are noted.

Echocardiology:

The response to the stress of handling can increase intracardiac blood flow velocity 300% in avian patients; therefore, inhalant anesthesia is preferred over manual restraint for performance of echocardiograms in all but the most docile of birds.³ Equipment constraints noted include an ultrasound unit with Doppler function, 100 frames /second minimum speed and micro curved or phased array probes with minimum 7.5 MHz frequency. Anatomical constraints in birds also limit the echocardiograph windows available. Parameters for chamber sizes, blood flow velocities, functional contractility, and valvular insufficiency have been determined for several species.² and studies are ongoing in this area.^{1,20,39}

The avian veterinarian is well-advised to work in conjunction with a cardiologist on any avian patient with suspected cardiac disease. Diagnosis of the cardiovascular abnormality present and formulation of a therapeutic plan will require both your knowledge of avian anatomy and physiology and the cardiologist's diagnostic skills and pharmacologic recommendations. Although most avian therapeutic regimes are still extrapolated from mammalian, numerous reports indicate that cardiac drug therapy can improve cardiac function, thereby increasing the quality and length of the bird's life.

NEOPLASTIC DISEASE

Cutaneous - benign

Xanthomas are generally friable, yellow-colored fatty-appearing masses that may be located anywhere on the body, but are often seen on the distal wing, in the sterno-pubic area and on the keel. The origin of xanthomas is unknown,

however, dietary improvement, including sufficient Vitamin A or Vitamin A precursors, has been noted to be curative in less advanced cases. Xanthomas tend to be very vascular and surgical excision, when necessary, should be undertaken with due attention to hemostasis. Diffuse xanthomas may be amenable to cryotherapy, but attention must be paid to maintenance of the vascular supply.

Lipomas occur most frequently in budgerigars, and are usually located on the keel or in the sternopubic area. Lipomas that cause clinical signs can be addressed via surgical excision. Malignant liposarcomas are rare in psittacines.

Cutaneous - malignant

Fibrosarcomas can occur anywhere on the body, but are most commonly seen in the oral cavity, associated with long bones, or in the abdominal cavity. They tend to be locally invasive and often recur with conservative surgical excision. Local treatment in the form of radiation therapy is often indicated for providing long-term control. The metastatic rate is low, so local disease management is paramount. Surgical excision followed by both radiation and chemotherapy has been reported with some success. Strontium radiation therapy, although limited by depth of penetration, has been anecdotally reported as efficacious in several instances.³⁵

Squamous cell carcinomas also may occur anywhere on the body, being most prevalent at mucocutaneous junctions of the head, on the distal wing, the phalanges, and the uropygial gland. Squamous cell carcinomas tend to be aggressively locally invasive, and complete excision is rarely accomplished. Radiation therapy has been attempted with some success, however squamous cell carcinoma appears to be an exceptionally radioresistant tumor and long-term control is rare. Anecdotal reports indicate that radioresistance may be even greater in birds than in mammals.^{19, 35} Strontium therapy when tumor depth is not a limiting factor has shown some promise in selected psittacine cases.³⁵ Distant metastasis is rare, therefore chemotherapy is not commonly utilized. Photodynamic therapy has been attempted in two reported cases. One case of SCC in the beak of a hornbill showed a positive result in decreasing tumor size but failure to eliminate the neoplasia.³¹ The second case demonstrated a positive response to PDT after each treatment, but treatments were not able to be administered at regular intervals.²⁷

Musculoskeletal system: Chondroma, hemangioma, and malignant tumors including osteosarcoma, chondrosarcoma, and leiomyosarcoma have all been reported. Wide surgical resection or amputation are generally the suggested methods of treatment, as benign lesions are often cured with complete excision and a decrease in tumor burden can be accomplished in malignant lesions. Extrapolation from canine and feline oncology may suggest other modalities, such as radiation therapy for additional local treatment and chemotherapy for systemic control. A biopsy should be obtained from patients where radiographic bony lesions are present. Under inhalant anesthesia, a 22 – 20 gauge needle can be surgically introduced into the bone. A sufficient sample is usually obtained and subsequently retained in the hub of the needle. The sample can then be dislodged with smaller gauge wire and submitted.

Internal carcinomas – ovarian neoplasias, (various cell origins), renal carcinomas, hepatic adenocarcinoma, hepatobiliary and pancreatic adenocarcinoma (related to papillomas in Amazons), splenic, and gastric carcinomas are all encountered. Anecdotal reports exist indicating intralesional carboplatin therapy may be useful in ovarian and renal adenocarcinoma, generally following surgical debulking and confirmation of the neoplasia via histopathology.^{18, 34} Bile duct carcinoma has also been treated with carboplatin successfully in one report.³⁸ Toxicity studies with cisplatin in cockatoos indicate that psittacine tolerance for this drug may be greater than that of mammals. Tamoxifen administration has not been evaluated for efficacy in cases of avian ovarian carcinoma, but anti-estrogenic activity was suggested and side effects were minimal in one drug trial.¹⁷ GnRH agonists (i.e. Depo-Lupron) have been effective empirically, (dosed at 200-800 ug/kg) however, confirmation of neoplasia (as opposed to cystic ovarian disease) has often not been obtained.^{16,20}

Gastric carcinomas, generally diagnosed at necropsy, are often found at the proventricular/ventricular junction. Death from gastric neoplasia may be due to hemorrhage, gastric perforation and sepsis or endotoxic shock, or inanition and subsequent wasting. Metastasis to the lungs has been confirmed in one case report.⁴

Biliary and pancreatic carcinomas are frequently diagnosed in the genus *Amazona* and to a lesser degree, *Ara*, in conjunction with internal papillomatosis.^{11, 13} A recent connection to a Herpes virus has been identified. Carboplatin has been used in several cases with equivocal results, but with no apparent toxicity.^{7, 35, 38}

NEUROLOGIC

Pituitary adenomas have been documented in multiple avian species but are most prevalent in budgerigars and cockatiels. Affected animals may present with acute neurologic conditions (seizures/opisthotonos). They may also present with conditions related to the pituitary hormone(s) that are affected. Usually, this will be pronounced polydypsia and polyuria. Occasional presentations will be that of a retrobulbar mass and subsequent exophthalmia.²⁶ In human medicine, surgical resection and radiation therapy (if needed) are utilized for treatment. Size and monetary constraints make routine treatment by these methods unlikely in our small psittacine patients.

LYMPHOMA/LYMPHOSARCOMA

Numerous reports of exophthalmos in psittacines, particularly young African Grays, have been diagnosed as retrobulbar lymphoma. Lymphoma may have many presentations in older pet birds, including lymphatic, hemopoetic, hepatic and subcutaneous lymphoma. Chemotherapy is the treatment of choice for systemic disease and surgery and radiation therapies have been successfully employed in cases of solitary lymphoma.^{6, 35} To date, no evidence of retroviral activity has been associated with psittacine lymphoma.

RESPIRATORY NEOPLASIA

Primary respiratory neoplasia is uncommon in psittacines.¹² An exception seems to be an intra thoracic neoplasia reported in cockatiels. It is characterized by the inclusion of two cell types, having both mesenchymal and epithelial cell components. Few other primary pulmonary neoplasias have been reported in the literature.² Metastatic pulmonary neoplasia may occur, but it is not noted with the same frequency as is documented in dogs.⁴

Note regarding treatment of psittacine neoplasia

The presentation of anecdotal treatments is problematic. Failure to include preliminary information regarding efficacy and/or clinical response may reduce the practitioner's willingness and ability to recommend treatment. However, future studies may either reinforce these experimental protocols, or they may demonstrate a lack of efficacy or serious side effects of these regimes.

To date, the treatment of avian neoplasia has mirrored treatment in other domestic species. Generally, solid tumors are best treated with surgical excision, while systemic neoplastic processes (i.e. systemic lymphoma, metastatic conditions) are most effectively managed with use of systemic chemotherapy. Cases in which surgical excision is incomplete or impossible may benefit from alternative forms of local therapy, including external beam radiation (Cobalt 60 or linear accelerator), cryotherapy, photodynamic therapy or hand-held radiation applicators.

When confronted with a confirmed diagnosis of neoplasia, a current literature search is warranted due to the rapid advances and changes in treatment recommendations. Consultation with a veterinary oncologist will increase the likelihood of selecting an appropriate treatment regime and properly administering the chosen therapy.

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(positive inotropic), promotes vasodilatation, and possibly decreases heart rate (negative chronotropic)

Awareness of the various syndromes that accompany aging allows the bird owner to recognize clinical signs and to seek medical assistance. Proper care and early detection can delay or prevent many geriatric illnesses

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