



Cancer in the Avian Patient: Diagnosis and Treatment Options

By Heather Wilson, DVM, Dipl. ABVP-avian; Royce Roberts, DVM, DACVR; Branson Ritchie, DVM, PhD, Dipl. ABVP-Avian, ECAMS; Stephen Hernandez-Divers, BVetMed, MRCVS, DACZM-reptiles, Kenneth Latimer, DVM, PhD, DACVP

Department of Small Animal Medicine, College of Veterinary Medicine, University of Georgia

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Cancer is relatively common in birds, and of the 27 orders of the Aves class, psittaciform birds have the highest reported incidence of neoplasia. In fact, neoplasms are more commonly reported in the budgerigar than in any other vertebrate animal. Despite the fact that cancer is a common problem in companion birds, treatment for avian patients with neoplasms has lagged far behind the technology available for other companion animals. This paper will focus on a few of the most common types of cancer that affect companion parrots, diagnosis, and the medical and surgical treatment options available.

Neoplasms of the integumentary system are common in psittacine birds and reportedly account for anywhere from 12 to 70% of all avian neoplasms. Lipomas and fibrosarcomas are the most frequently observed.

Lipomas (benign fatty tumors) are the most common neoplasm of companion birds, with a reported incidence of 10% to 40% in budgerigars. Diagnosis is usually easily made from aspiration of the mass. Lipomas can be large and may interfere with normal locomotion and breeding. Surgical excision is often necessary if the tumor is causing clinical problems. Lipomas can be highly vascular in birds and hemostasis is of the utmost importance. The Cavitron Ultrasonic Surgical Aspirator (CUSA System 200, Valleylab, Boulder, CO, USA) has been shown to have a wide variety of surgical applications in humans, dogs and other mammals. The

CUSA is an ultrasonically powered aspirator that selectively fragments and aspirates parenchymal tissue while sparing vascular or ductal structures. The CUSA's potential applications in avian species is just beginning to be explored at UGA. Preliminary evaluation suggests that when used to resect lipomas in avian patients, the CUSA may provide decreased tissue necrosis and hemorrhage, increased visibility, and shortened operating and recovery times in comparison to more conventional surgical methods such as cold knife, bipolar cautery and CO2 laser. Other integumentary neoplasms seen in birds include lymphosarcoma, fibrosarcoma, and squamous cell carcinoma, to name some of the most common. Diagnosis is usually via surgical biopsy. Treatment may involve radiation therapy, chemotherapy, surgical removal, or other modalities.

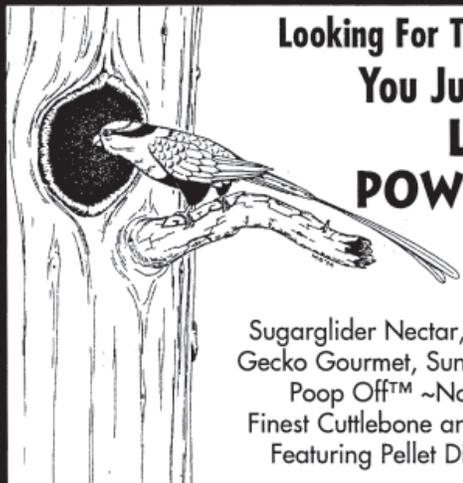
For most humans and mammalian companion animals, radiation therapy is an important part of treatment for many of these neoplasms. An understanding of the tolerance of normal tissues included in the treatment field is essential in radiation treatment planning for any animal. Dose response and normal tissue injury have been evaluated extensively in many companion animals. However, there have been no controlled studies of external beam radiation therapy in any avian species. Currently used dosages for external beam megavoltage radiation therapy in birds have been extrapolated from mammalian patients and often appear to provide inadequate doses of radiation for effective tumor control.

Thus the goal of the study at UGA was to determine the tissue tolerance doses of the skin and mucosal tissues (such as the crop or ingluvies) of normal birds in order to provide more effective treatment for tumors that have been shown to be radiation responsive in other species. A 2 cm x 2 cm area over the crops of nine Psittacine birds were irradiated in 4 Gy fractions to a total dose of either 48, 60, or 72 Gy using an isocentric Cobalt-60 teletherapy unit. Minimal radiation-induced skin changes were present in one group histologically. No dose-related acute or chronic radiation effects could be detected grossly in skin or crop tissue over a 12 month period. Thus proving that birds can tolerate a much higher dose of radiation than mammals and that higher doses may be needed for control of cancer in these patients.

One important part of chemotherapy is understanding which drugs to use, how much to use, and what side effects may occur. The pharmacokinetics of two important drugs often used, carboplatin and cisplatin, have been done in cockatoos at the University of Queensland, Australia. Clinical experience using these drugs to control cancer in birds has been variable and more work needs to be done.

Additionally, studies have been done at UGA to determine the best doses for a new non-steroidal, anti-inflammatory drug, Meloxicam. Reduction of pain and inflammation is an important part of medical and surgical management of avian patients, especially those with cancer. However, information on the pharmacokinetics and pharmacodynamics of anti-inflammatory drugs in psittacine birds is relatively scarce. Meloxicam preferentially inhibits COX-2, making kidney and gastrointestinal side effects less common. The drug comes in both an injectable and an oral, honey-flavored liquid that is easy to administer and is well accepted by birds. This study evaluated the pharmacokinetics of meloxicam given to ring-necked parakeets (*Psittacula krameri*) orally and intravenously. The results suggest that meloxicam may be administered at 0.5 mg/kg twice daily orally or every 4 hours intravenously for short term use, although further studies are needed to understand how this drug works in birds and how to best use it over the long term.

All research projects described herein have been reviewed by the UGA Animal Care and Use Committee and have been approved. Additionally, the projects have been reviewed and approved by the UGA Clinical Research Committee and the Hospital board. ■



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