Proceeding of the SEVC
Southern European Veterinary Conference

Oct. 2-4, 2009, Barcelona, Spain

http://www.sevc.info

Next conference :

October 1-3, 2010 - Barcelona, Spain

Reprinted in the IVIS website with the permission of the SEVC
www.ivis.org
Treatment of avian neoplasia is based on treatment in other domestic species, which in turn was initially derived from human medicine and oncology. Generally, solid tumors are best treated with surgical excision. When surgical excision is incomplete or impossible, alternative forms of local therapy, including external beam radiation (Strontium 90, Cobalt 60 or linear accelerator), intralesional chemotherapy, cryotherapy, photodynamic therapy or hand-held radiation applicators may be used.

Systemic neoplastic processes are most effectively managed with chemotherapy. The use of alternative therapies for treatment of neoplasia is beyond the scope of this lecture, although their use in conjunction with traditional chemotherapy seems to be increasing.

**Pseudo-neoplastic conditions** - xanthomas and lipomas.

Xanthomas are friable masses that may be located anywhere on the body. They are generally yellow-colored and fatty-appearing. The most common locations include the distal wing, sterno-pubic area and the keel. The origin of xanthomas is unknown, however, dietary improvement, including reduction of fatty foods and 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 Amazons, but can occur in any avian species. Lipomas are usually located on the keel or in the sternopubic area. Lipomas in their early stages are amiable to dietary therapy, while those that cause clinical signs can be addressed via surgical excision. In obese hens, stern-pubic lipomas may be associated with abdominal hernias, complicating resection. Malignant liposarcomas are rare in psittacines.

**Fibrosarcomas** (FSA) can occur anywhere on the body, but are most commonly seen in the oral cavity, associated with long bones, or in the abdominal cavity. Fibrosarcomas may be subcutaneous or deep, and often appear fixed and proliferative with a nodular, red surface. Metastasis can occur, but FSA tend to be locally invasive and often recur with conservative surgical excision. Therefore, additional local treatment in the form of radiation therapy is often indicated for providing long-term local control. Surgical excision followed by both radiation and chemotherapy has been reported with some success in a few publications. Strontium radiation therapy, although limited by depth of penetration, has been anecdotally reported as efficacious in several instances.

**Squamous cell carcinoma** (SCC) may occur anywhere on the body, being most prevalent at mucocutaneous junctions of the head, in multiple locations in the oral cavity, on the distal wing and on the phalanges. The uropygial (preen) gland may also develop squamous cell carcinoma. Squamous cell carcinomas tend to be extremely locally invasive, and complete excision is rarely accomplished. However, surgical resection or debulking of the mass will increase the efficacy of subsequent treatment. 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. Strontium therapy when tumor depth is not a limiting factor has shown some promise in selected psittacine cases.

Squamous cell carcinoma rarely metastasizes to distant sites, so systemic chemotherapy is not commonly utilized. Photodynamic therapy has been attempted in one reported case with a positive result in decreasing tumor size but failure to eliminate the neoplasia and in a second case was successful in inducing a remission. Other therapies that have shown promise with SCC include intralesional cisplatin, cryotherapy and use of these modalities in combination.

**Musculoskeletal tumors:** These include theoretically benign lesions such as chondroma and hemangioma,
and malignant tumors including osteosarcoma, chondrosarcoma, and leiomyosarcoma. 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.
Osteosarcomas in other species carry high metastatic rates, and additional therapies may be indicated.
Extrapolation from canine and feline oncology may suggest other modalities, such as radiation therapy for
additional local treatment and chemotherapy for systemic control.

- **Chondromas** - Treatment generally involves aggressive surgical excision of the affected area. Radiation
and chemotherapy may be considered.

- **Osteosarcoma** – Amputation with follow-up chemotherapy is the generally recommended protocol. Breed
and anatomic location predilections have not been noted in psittacines, and confirmation of this diagnosis in
the literature is rare⁹.

- **Hemangiomas** seem to occur more commonly than hemangiosarcomas in birds. This neoplasia may be
internal or external and commonly appears as a red-purple flat firm lesion¹⁰.

**Internal carcinomas** occur with some frequency in psittacine birds. These include ovarian neoplasias of
multiple cell origins¹¹, renal carcinomas, hepatic adenocarcinoma, hepatobiliary and pancreatic
adenocarcinoma (which is often associated with the herpes virus causing papillomas in Amazons and
macaws), splenic, esophageal and gastric carcinomas.

Anecdotal reports exist indicating intralesional carboplatin therapy may be useful in ovarian and renal
adenocarcinoma. Bile duct carcinoma has also been treated with carboplatin successfully in one report.
Toxicity studies with cisplatin in cockatoos indicate that psittacine tolerance for this drug may be greater
than that of mammals¹².

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 trial¹³. GnRH receptor
agonists (i.e. Depo-Lupron, leuprolide acetate) have been effective empirically, (dosed at 200-800 ug/kg)
however, confirmation of neoplasia (as opposed to cystic ovarian disease) has often not been confirmed
prior to therapy. The use of deslorelin as a surgical implant in Europe has shown promise, and hopefully the
participants at the SEVC can share their experiences with this medication. It is not yet available in the U.S.

Adriamycin (doxorubicin) is commonly employed in the treatment of carcinomas in human and canine
patients. The limiting toxic effects of doxorubicin include myelosuppression and cardiac toxicity. To date, the
degree to which these concerns will apply to avian cancer patients has not been determined.

Gastric carcinomas, generally diagnosed at necropsy, are often found at the proventricular/ventricular
junction¹⁵. Death from gastric neoplasia may be due to hemorrhage, gastric perforation and sepsis or
endotoxic shock, or inanition and subsequent wasting. Esophageal carcinomas have also been diagnosed¹⁶.

Biliary and pancreatic carcinomas are frequently diagnosed in the genus *Amazona* and to a lesser degree,
*Ara*, in conjunction with internal papillomatosis¹⁷,¹⁸. A recent connection to a herpes virus, stated to be the
same one that is responsible for the peracute syndrome known as Pacheco’s disease, has been
identified¹⁹,²⁰.

Surgical excision is the treatment of choice with solitary lesions of hepatic cell carcinoma in other species and
is the only documented curative treatment in human medicine. Combinations of chemotherapy and radiation
therapy have been used with equivocal results in people in an attempt to prevent or limit metastatic
disease. Extrapolation from people would indicate that this type of cancer is highly resistant to
chemotherapy. The most commonly employed chemotherapeutic agents in human medicine are doxorubicin
and 5-fluorouracil, however, mean survival times do not appear to be statistically improved by treatment in
patients with widely disseminated disease. The use of immunotherapy, including interferon, in conjunction
with cisplatin, doxorubicin and 5-FU, has shown the most promise to date in human patients. Unfortunately,
interferon is limited in its usefulness by cost and availability in veterinary medicine²¹.

**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. 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 patients²².
**Endocrine:** Infrequent accounts of primary pancreatic neoplasia of variable cell origin, not associated with internal papillomatosis, have been reported\(^23\),

**Thymomas** are not as common in birds as they are in domestic rabbits, but do occur. They may be intra-thoracic or located in the area of the neck. In humans, classification according to cell type (medullary, cortical and mixed) is a prognostic indicator, with cortical tumors having the highest incidence of recurrence and malignancy. Thymoma and thyroid adenocarcinoma have been reported in several psittacine species. Surgical excision is the primary treatment recommendation. Adjuvant radiation and chemotherapy protocols are being utilized in human medicine. Cisplatin is used in many human chemotherapy protocols for thymomas and thymic carcinomas. Limited studies have shown that psittacines may be tolerant of the common side effects induced by cisplatin, and this agent may be useful in the treatment of these neoplasias.

**Lymphoma/Lymphosarcoma**

Numerous reports of exophthalmos in psittacines, particularly young African Grays, have been diagnosed as retrobulbar lymphoma. Differential diagnoses for this condition are pituitary adenoma and hyperplasia or adenoma of the Harderian gland. Lymphoma may have many presentations in pet birds, much as it does in other companion animals. Chemotherapy is the treatment of choice for systemic disease and surgery or radiation therapy have been successfully employed in cases of solitary lymphoma. To date, no evidence of retroviral activity has been associated with psittacine lymphoma\(^24,25\),

**Respiratory Neoplasia**

Primary respiratory neoplasia is uncommon in psittacines. 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. Metastatic pulmonary neoplasia may occur, but it is not noted with the same frequency as is documented in dogs.\(^26\)

When confronted with a confirmed diagnosis of neoplasia, a current literature search is warranted due to the rapid advances and changes in treatment recommendations. 27, 28 Consultation with a veterinary oncologist will increase the likelihood of selecting the appropriate treatment regime and properly administering the chosen therapy.

**References and Recommended Reading:**

9) Watson CL, Lucroy AB, Primary Appendicular Bone Tumors in Dogs, Compend Contiu Educ Pract Vet 24(2):128-138 Feb'02

Proceedings of the Southern European Veterinary Conference & Congreso Nacional AVEPA, 2009 - Barcelona, Spain
28) Hahn KA; Jones MP; Petersen MG; Patterson MM; Nolan ML, Metastatic pheochromocytoma in a parakeet, Avian Dis 41[3]:751-4 1997 Jul-Sep.