To boldly cut: surgical solutions for veterinary head and neck cancer

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Introduction

Cancer of the head represents a significant portion of cases presenting to primary care veterinarians, posing complex diagnostic and therapeutic challenges. These malignancies encompass a diverse range of tumours affecting structures such as the oral cavity, ears, nasal passages, skull, and salivary glands. From oral and aural tumours to nasal and skull tumours, and even salivary gland tumours, the presentation of head and neck cancers in dogs and cats can vary widely, making early detection and intervention crucial for optimal patient outcomes. Understanding the prevalence, presentation, and management of these cancers is paramount for veterinarians in providing comprehensive care to their patients. The biggest demarcation with respect to tumours of the head which predicts outcome would be species.

Tumours of the head in cats

In cats, the most common tumour type we see is squamous cell carcinoma. The behaviour of feline squamous cell carcinoma (SCC) varies widely based on the anatomical site. Squamous cell carcinoma of the cat head can occur in the nasal planum, cutaneously on the eyelids, ear pinnae and temporal regions, maxilla/mandible and ear canal.

Cutaneous and nasal planum SCC in cats

Generally, SCC of the nasal planum and the cutaneous regions tends to be locally variably invasive but is unlikely to metastasise. These tumours can be fairly superficial, responding to local therapies, or deep, responding only to extensive surgery.

Local therapies for superficial tumours include plesiotherapy/radiation therapy, cryotherapy, surgery, electrochemotherapy, photodynamic therapy and palliative care.

- Plesiotherapy/radiation: Plesiotherapy uses strontium-90 directly applied to the tumour. It only penetrates about 2mm so is only effective for very superficial tumours. External beam radiation therapy is appropriate for superficial lesions as well as more extensive ones. Plesiotherapy has a median disease-free interval (DFI) of 34 months. External beam radiation therapy has a median DFI of 361 days to 16.5 months.
- Cryosurgery is only appropriate for cats with very superficial lesions. It involves the use of a liquid-nitrogen called probe to freeze the tissue (usually using a few freeze-thaw cycles). The median DFI is about 250 days and median survival time (MST) is 682 days.
- Surgery is traditionally the mainstay of treatment with nasal planectomy being the preferred procedure for nasal planum tumours. The MST is 673 days. Nasal stenosis is a potential complication and can be associated with the excessive use of electrocautery. May be combined with a partial maxillectomy for extensive lesions.
- Electrochemotherapy is my preferred method to treat facial SCC. In my experience, the local control rate is around 85% with one or more treatments. Recurrence rates of 22.5% have been reported. The treatment involves the injection of either systemic or intralesional bleomycin. This is followed by multiple electric shocks resulting in pores forming in cancer cells with concentration of the bleomycin within the cells. Apoptosis is induced. There is minimal toxicity or side-effects. It can be repeated as necessary.

Mandibular, maxillary and sublingual SCC in cats

These are the most common tumours which occur in the cat mouth. They are highly invasive and can also be metastatic. Surgery is associated with high local recurrence rates, local recurrence and reluctance to eat for months. It is generally my opinion that these patients should be treated palliatively with the exception of very localised and surgical amenable lesions. If mandibulectomy/maxillectomy is performed, a feeding tube should always be placed. Even when surgery is combined with radiation therapy the median survival time is less than four months. Chemotherapy has not been shown to be effective for these tumours.

Ear canal squamous cell carcinoma in cats and dogs

In contrast to ceruminous gland adenocarcinoma in cats and dogs which have a 48-month MST with total ear canal ablation, ear canal SCC is usually highly invasive with potential for metastasis. The MST for ear canal SCC in cats is only 3.8 months. Treatment is directed at surgical excision and adjuvant radiation therapy can improve survival with a median DFI of 40 months.

Tumours of the head in dogs

Oral tumours

Oral tumours in dogs are relatively common and can encompass a variety of benign and malignant growths that develop in the mouth, gums, tongue, and other oral structures. Common types of oral tumours in dogs include melanomas, squamous cell carcinomas, fibrosarcomas, epulides, odontogenic tumours, and osteosarcoma.

A pneumonic for remembering the common oral tumours in dogs is FOAMS at the mouth (fibrosarcoma, osteosarcoma, acantomoatous epulis or aemloblastoma, melanoma and squamous cell carcinoma).

Symptoms of oral tumours in dogs can include bad breath, drooling, difficulty eating or swallowing, bleeding from the mouth, swelling or masses in the mouth, loose teeth, oral pain, and jaw swelling. Early detection and treatment are crucial in improving the prognosis for dogs with oral tumours.

Treatment options for oral tumours in dogs may include surgery, radiation therapy, chemotherapy, and palliative care.

Oral fibrosarcoma is a relatively common tumours in dogs, and most commonly in Golden Retrievers. They appear as smooth pink swellings of the mandible or maxilla. Histologically they appear to be benign or low-grade malignant. The behaviour is more characteristic of a malignant tumour with frequent recurrence and metastatic rates of around 25%. Metastatic lesions can appear in the lungs and also in the lymph nodes. These have the highest recurrence rate of any tumour I treat surgically in my practice.

Oral osteosarcoma is somewhat less common than fibrosarcoma in dogs. They can occur in the mandible and maxilla. Metastatic rates appear to be lower than those seen in the appendicular skeleton. Recurrence appears to be the life-limiting factor in maxillary osteosarcoma with MST’s of only two months with surgery. Mandibular osteosarcoma is less aggressive with an MST of 17 months with surgery only. The role of chemotherapy in oral osteosarcoma is unknown.

Acanthomous epulis or ameloblastoma is a locally aggressive tumour with no metastatic behaviour what-so-ever. Surgery is the mainstay of treatment with local cure rates of about 85% with appropriate surgery. Surgery must include the removal of bone in the form of partial mandibulectomy or maxillectomy. Less aggressive surgery will invariably result in recurrence. Radiation therapy is also effective with similar results, obviating the need for surgical resection. Orthovoltage radiation therapy may cause malignant transformation to osteosarcoma, although it is possible that these cases had a mis-diagnosed osteosarcoma to start with.

Melanoma is a relatively common tumour of the dog mouth. Often the tumours have a pigmented appearance but may in some cases be pink (amelanotic melanoma). Prognosis indicators include tumour size, presence of gross evidence of metastasis to lungs or lymph nodes, mitotic index, histological grade and immunohistochemistry markers. Large tumours have a high metastatic rate. Tumours occurring in the soft tissue of the lips or cheeks can have a more favourable prognosis. Surgery is generally the mainstay of treatment, but radiation therapy alone can also provide survival benefit. Tumour vaccines also have shown promise and chemotherapy as an adjuvant is thought to be helpful as well. Surgery must include removal of bone in the form of a partial mandibulectomy or maxillectomy.

Squamous cell carcinomas occur relatively frequently in dogs. Surgery is the mainstay of treatment, with the location of the tumour being the primary prognostic indicator. Rostral tumours have a more favourable prognosis than caudal tumours. Surgery must include removal of bone in the form of a partial maxillectomy or mandibulectomy.

Specifics about the surgical techniques for mandibulectomy and maxillectomy are beyond the scope of this presentation.