ORAL MASSES: BENIGN AND OTHERWISE

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Growths within the oral cavity tend to be overlooked until they are of sufficient size to either attract the owner's attention, or to cause the pet to exhibit dysfunction. Accurate diagnostics are essential as therapy and prognosis are heavily dependent on the type of mass present. Non-neoplastic masses of the oral cavity include odontogenic cysts and tumours, and other benign epulides. These tumours do not metastasize but can be locally invasive. Patients can be cured with appropriate surgical excision that guarantees clean margins. Cancerous masses still tend to have a grave prognosis in the feline, but advances are being made for the canine patient.

DIAGNOSTICS

It is not possible to definitively distinguish between a benign or cancerous oral lesion visually. Differentiation may require impression smears (eosinophilic granuloma, mast cell tumor, cryptococcus, melanoma), fungal titer, dental radiographs prior to biopsy, and an incisional biopsy (large lesions, suspected cancer) using a punch biopsy or a scalpel. Excisional biopsy may be appropriate for a small/discrete mass (dentigerous cyst, epulides) should the surgical excision be of sufficient size and technique that the excision is also curative. Excisional biopsies are not appropriate if removal of all the pathology is unlikely, if the original extent of the lesion is lost and if precious soft tissue is contaminated as this will make closure after a second surgery very difficult. Blood chemistries will identify if a patient is not a candidate for some therapies, or to monitor success of treatment (lymphoma). Tumor staging for neoplasms should include local lymph node aspiration or excision, chest radiographs, and possibly a CT or MRI scan.

CANCERS

The vast majority of oral cancers in the cat confer a very poor prognoses for survival, but may not be as fatal in the dog. Variation in survival rates are influenced by the size of the patient and the difficulty in getting clean margins while leaving a functional animal, as well as the variation in behaviour of cancers between species.

Tumour staging aids with therapeutic decision making and survival time estimates. Depending on the cancer local lymph node biopsy or aspiration can be negative for metastases until late in the disease. In a recent study, only one third of the feline cancer cases had a regional node that contained tumour cells on histologic examination. Fine needle aspiration detected 90% of these histologically positive nodes, however the mandibular lymph node was often negative for tumour cells which indicates veterinarians need to sample several of the regional lymph nodes. If multiple nodes cannot be aspirated then surgical excision should be conducted.

Chest radiographs are important. Fibrosarcoma may produce chest metastases before detectable lymph node involvement, and melanoma and osteosarcoma are notorious for pulmonary involvement. If an attempt at radical surgery is being considered involving the maxilla it behooves the practitioner, if at all possible, to get a CT or MRI scan as this is the ONLY way you will get an accurate depiction of margins. It is not fair to the patient, nor the client, to remove half a face only to have local recurrence. Rant over.

Squamous Cell Carcinoma (SCC)

SCC is very locally invasive. Symptoms usually relate to the degree of bone invasion, which when radiographed, is often significantly greater than the clinical lesion would suggest.

SCC is quite variable in the dog. In general, a dog may be able to be cured of its disease if the tumour is more rostrally located and clean surgery margins can be achieved. Papillary SCC has a good prognosis, while a lingual, tonsillar or caudally located SCC has a grave prognosis. 98% of dogs with SCC of the tonsil had early metastasis to the lymph nodes, and 63% had mets to distant sites. For these patients, chemotherapy with cisplatin or carboplatin with piroxicam may produce a 1.0 year survival.

50% of dogs with SCC of the tongue will suffer from metastatic disease. Surgery can be more aggressive in the dog as they will tolerate having all of their free tongue removed, or half of the tongue's total mass. Survival is 8 months. Radiation alone of glossal SCC gives only 4 months survival.

Papillary SCC tends to occur in young animals and removal with moderate margins can be curative. It is also radiation responsive. Awareness of this variation of SCC may improve prognosis as delayed diagnosis can play a factor in survival.

SCC is the scourge of our feline patients. It is difficult to get clean surgery margins in a cat. Important anatomical structures, plus a cat's different temperament, limits surgical excision. Even with clean margins at the time of surgery local recurrence is common. SCC in cats is poorly radiosensitive. Used as the sole treatment, survival time may be 3 - 6 months. Radiation after surgery with dirty margins has a survival of 3.5 months. Radiation in conjunction with surgery that had clean margins (therefore a very small tumour) provided an average survival time of 12.5 months. Studies are ongoing into new radiation protocols that involve more frequent fractions in an effort to deliver lethal doses to the lesion before regrowth occurs. Currently most cats die from recurrence, or side effects from treatment, before finishing a planned set of treatments.

Chemotherapy.....many have tried, many have failed. Carboplatin, doxorubicin, piroxicam, etc., alone and in combinations, seem to provide small gains. Cimetidine may have an adjunctive role, and seems to be more efficacious than ranitidine or other medications of the same family.

The overall one-year survival rate in cats is less than 10% and the median survival time approximates 2 months. Unremitting pain is the primary underlying cause of euthanasia, with its attendant inappetence, depression, inability to groom, secondary infection of the site, and loss of “enjoyment for life”. Palliative therapy should include strong efforts to control this pain. Analgesics such as opioids (Fentanyl transdermal patch, sustained release injectable buprenorphine), NSAIDs (meloxicam, piroxicam), gabapentin, etc. are appropriate. They can be used in combinations for a synergistic effect. Nutritional support with appropriate diets, and esophageal or PEG feeding tubes, is important. Supplementation will mediate the cachexia.

Fibrosarcoma (FSA)
FSA is uncommon in the cat, but does occur. In the dog this cancer is characterized by extensive bone resorption, usually of the hard palate. Local invasion causes a high recurrence rate (68%) while metastasis to local lymph nodes occurs in 35% of cases.

Histologically low grade/biologically high grade FSA is very difficult to diagnose and surgery may need to be undertaken based on clinical progression and "suspicion". If the histologic report does not agree with the clinical picture this version of FSA should be considered.

Accurate assessment of margins is critical to successful treatment. Dental radiographs and advanced imaging techniques are needed to establish the extent of this tumour. Surgery margins should be 2 - 3 cm, which limits surgical candidates. FSA is generally considered poorly responsive to radiation, but radiation after surgery improves survival somewhat in dogs. In cats it may be of some use for palliation as it can slow the progression for approximately 6 months. Chemotherapy is as for SCC.

Malignant Melanoma (MM)
MM is one of the most common cancer of dogs, but is rare in cats. There is currently some effort being made to distinguish between two (or more) different levels of aggression within this tumour family. Melanocytic tumours, or melanocytomas, tend to be small masses located in the rostral oral cavity and cannot be classified as either benign (naevi) or malignant (melanoma) because they show features of both. These tumours show a lower mitotic index and tend to be less locally invasive than the “usual” MM. Surgical removal with clean margins, and especially if followed with the MM vaccine, can be curative.

The MM we fear has a predilection for the gingival margins, and the tonsils, but can be found anywhere. It has an inverse survival time the further caudad in the oral cavity it is located. The patient may die from local disease or metastatic disease. At the time of detection there is already thoracic and lymph node involvement in many of these cases, which is why surgery alone has a poor survival rate. If surgery is considered then imaging of the

area is very important, both with dental radiographs and CT ideally. Survival time with just surgery, and clean histologic margins is 2-9 months. MM is poorly radiation responsive. Chemotherapy with carboplatin provides the "best" response with a 23.5 week median survival currently, but intralesional cisplatin with piroxicam is promising.
Immunotherapy is the current co-therapy of choice. After surgical staging and debulking the MM vaccine can be given if the dog is rated as less than Stage 3. The goal of the vaccine is multi-year survival. For clients who cannot afford the above therapies cimetidine appears to offer some palliative, and possibly actual clinical, improvement in survival. Interferon has not improved survival times in humans.

Plasmacytoma
This is a tumour of plasma cell origin so it may develop in association with lymphosarcoma or multiple myeloma. If it develops in isolation systemic signs are unlikely. It is rare in cats. Plasmacytomas can develop rapidly, and are usually well circumscribed, but occasionally are invasive. They are often on the lips. Moderate-to-aggressive surgical excision is curative but radiation is successful in some patients.

Osteosarcoma (OSS)
This tumour is uncommon in the cat but in dogs 3% of all OSS cases are in the mandible, and another 3% are in the maxilla. OSS of the oral cavity has been shown to be much slower to metastasize compared to appendicular lesions. Excision is the treatment of choice, followed by chemotherapy. This combination provides excellent longevity.

Lymphosarcoma/Epitheliotrophic Lymphoma
Oral lymphosarcoma, and/or epitheliotrophic lymphosarcoma, is usually a result of systemic dissemination from another site. It can be found in the tonsil (unilateral), but can be on the lips or gingiva. These tumours are responsive to chemotherapy (treatment of choice) and/or radiation.

Schwannoma
Schwannomas are usually found in the soft tissues of the cheek/lips. This cancer follows the nerve sheath therefore excision must be wide, and recurrence is not uncommon.

Chondrosarcoma
Chondrosarcoma is uncommon in the oral cavity of dogs and cats. It is usually slowly progressive (months), but highly invasive to surrounding bone. < 15% will be a histologically high grade tumour, and those that are will act like an OSS and will metastasize to the lungs. Death is usually due to reoccurrence locally, and cachexia. Treatment requires radical excision with 2 cm margins. This tumour is poorly responsive to radiation or chemotherapy.

Mast Cell Tumour
Mast cell tumour can masquerade as granulation tissue or eosinophilic granulomas. In the cat it may involve the whole mouth and look like stomatitis. Mast cell tumours may metastasize to the regional lymph nodes, but are usually a result of systemic dissemination from another site. CCNU (lomustine), and cimetidine have shown some efficacy against this tumour.

Hemangiosarcoma
Hemangiosarcomas are highly malignant with early metastasis, and therefore carry a poor prognosis. These tumours tend to be found in the maxilla.

ODONTOGENIC TUMOURS, CYSTS AND EPULIDES
Non-cancerous masses within the oral cavity include odontogenic tumours, cysts, and "epulides". Most odontogenic cysts and tumours are rare in all species, and mislabeling has confounded the attempts to quantify these masses from archived literature.

The correct definition of an epulis is ANY localized swelling on the gingiva. Casual use of this term has lead to inaccurate identifications of gingival masses, many of which are actually odontogenic tumours. Misunderstanding the origins of the masses has lead to inappropriate treatments, which have become dogma within veterinary literature (eg. extracting the local tooth and curetting the socket to remove periodontal ligament as the treatment for “epulides”).

The oral cavity and teeth form from the ectoderm and mesoderm in the developing embryo. Teeth develop when ectodermally derived layers of ameloblasts (enamel) stimulate layers of odontoblasts (dentin) to begin forming the crown of the tooth. These layers then expand and encompass mesodermally derived mesenchymal connective tissues. These tissues become the pulp tissues within the tooth. Disregulation, or failure of any part of this formative process can result in tumours.

Dentigerous Cyst
Every tooth forms inside of a "dental sac". As part of the eruption process the dental sac makes fluid, the accumulation of which creates an outward expansion which pushes bone aside. This helps move the tooth to the dorsal alveolar ridge and erupt. Once the tooth has erupted the dental sac breaks down and disappears. Failure of the tooth to form normally, displacement from its proper position, or an impediment to eruption can result in continuous fluid production into the dental sac and a radiolucent defect within the alveolar bone develops. This is known as a dentigerous cyst. The cyst can be very expansive and damage neighbouring teeth. Surgical excision with curettage to remove the cyst lining (ie. the dental sac) is curative.

Radicular Cyst
Once the dental sac has ruptured the majority of it disintegrates. Residual cells will continue to exist within the periodontal ligament space adjacent to the tooth roots. Occasionally these cells will be reactivated, usually in association with the tooth becoming non-vital, and a radicular (root) cyst will form. Surgical excision, combined with treatment of the non-vital tooth, is curative. Treatment of the tooth can include endodontics or exodontics.

Feline Inductive Odontogenic Tumour
This tumour is unique to cats, and contains ameloblastic epithelium arranged around pulp tissue. It is usually found in the rostral maxilla of young cats, usually less than 18 months of age, of either sex. The tumour is locally invasive, poorly circumscribed, and appears to arise multifocally within the surrounding connective tissues and/or bone. As it has indistinct boundaries, surgical excision should include a moderate (1 cm) margin.

Odontoma
An odontoma forms late in tooth development, and contains enamel, dentin, and pulp tissues. It may be “complex” and have the dental tissues present but in disarray, or be “compound” which means that multiple denticles composed from properly oriented dental tissues are present. Excision is curative.

Acanthomatous or Peripheral Ameloblastoma
An “acanthomatous epulis” is now more accurately named a peripheral ameloblastoma or acanthomatous ameloblastoma. A true acanthomatous ameloblastoma does not appear to occur in cats. (Critical review of previously documented cases found the tumors were actually either feline inductive odontogenic tumors or amyloid-producing odontogenic tumors.) These tumours in dogs are locally invasive into bone, are considered by some pathologists to be a "within the spectrum of" squamous cell carcinoma, and must be removed with 1 cm margins. These are NOT benign and should not be "monitored". Rim excision in the caudal mandible may be appropriate.

Peripheral Odontogenic Fibroma
There is no histological difference between a “fibromatous epulis” and an “ossifying epulis” other than the amount of mineralization found in the mass. These mislabeled epulides are actually peripheral odontogenic fibromas - some mineralized or “ossified”, others not. These are slow growing, benign neoplasms arising from the connective tissues adjacent to the tooth, and will occasionally contain some periodontal ligament fibers. This is the source of the old treatment recommendation to extract the tooth and curette the socket. Surgical excision

with 5 mm margins is a much more appropriate treatment.

OTHER "BENIGN" MASSES

Multiple Feline Epulides (MFE)

This is another rare condition in cats. They are soft tissue in origin and are thought to be inflammatory/reactive to an unknown irritation such as calculus, an unknown virus, etc.. They often recur after conservative treatment. To date the only long-term resolutions were derived from extraction of the teeth and reduction/removal of the gingival overgrowths.

Gingival Enlargement/Hyperplasia/Hypertrophy

Gingival enlargement is a clinical description that includes gingival hyperplasia and gingival hypertrophy. These conditions have different etiologies. Gingival hyperplasia (a histologic diagnosis) results from chronic inflammation usually from plaque bacteria. Rather than a "melting away" of the gingival tissues as usually occurs with periodontal disease there is fibrous tissue accumulation within the gingival tissues. A genetic predisposition to gingival enlargement (eg. Boxers) and/or systemic factors such as hormone level changes (puberty, pregnancy) may predispose to gingival enlargement may then also allow plaque accumulation under the enlarged tissues with chronic inflammation and hyperplasia. Plaque-induced cases must receive daily and immaculate plaque control or the masses will regrow.

Several medications may cause gingival hypertrophy (histology shows an increased volume of extracellular matrix proteins - think "swelling") including some anticonvulsants, cyclosporine, some calcium channel blockers (eg. amlodipine) and possibly oclactinib (Apoquel). Reduction in dose, or changing to another medication may allow gingival enlargement to improve without other intervention. Azithromycin toothpaste may benefit THIS cause of gingival enlargement.

Gingivectomy and gingivoplasty may be needed in any case of gingival enlargement to return gingival contours to normal.

Eosinophilic Granulomas

Eosinophilic granulomas tend to present as a granuloma on the tongue, hard and/or soft palate, lip, and oral mucosa. Histologically the lumps tend to show nodular to diffuse granulomatous inflammation with flame figures. Eosinophils and multinucleated histiocytic giant cells are common. Treatment is aimed at ectoparasite and allergen control, judicious use of corticosteroids, chlorambucil, cyclosporine, cetirizine, and surgical excision if the granulomas are large and/or interfering with respiration or deglutition. There are recent reports that use of oclacitinib (Apoquel) has aided (usually ulcerous) lesions to heal.

Papillomas

Papillomas, colloquially known as "warts", develop from a viral infection which tends to affect juvenile animals. Infection is spread through oral contact and through fomites. An infected animal may have a single papilloma or multiple. They tend to be self-limiting and will regress spontaneously within weeks to months. Treatment may involve "tincture of time", correcting an underlying immune-suppression, azithromycin, alpha interferon, surgical, cryo or laser removal, and/or the homeopathic Thuja. For external papillomas imiquimod (encourages self-production of interferon) may be of benefit but cannot be used internally which limits its usefulness. Poor response to treatment in an adult dog is abnormal and should be investigated as these animals are almost always immunocompromised in some manner including underlying lymphoma. Rarely these infections can spontaneously transform into squamous cell carcinoma.

SUMMARY

Oral neoplasia carries a poor prognosis with radical therapy usually needed. Palliation must involve pain control, nutritional support, and infection control. Non-neoplastic masses are usually curable with surgery and/or medical treatment. Appropriate therapy for any oral mass requires definitive diagnosis.