Oral Masses and Neoplasia for the General Practitioner

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Neoplasia of the oral cavity represents about 6% and 3% of all canine and feline tumors, respectively. An accurate histological diagnosis is necessary for a treatment plan and prognosis. Biopsy may be incisional or excisional. A coordinated effort with a veterinary dentist/oral surgeon and an oncologist can provide current treatment options. Oral tumors can be classified as odontogenic or non-odontogenic in origin

Odontogenic tumors

By definition an epulis is any gingival growth. Hence, gingival hyperplasia or any malignant tumor is also, by definition, an epulis. However, historically "epulides" were referred to as benign locally invasive tumors. Canine acanthomatous ameloblastoma, peripheral odontogenic fibroma, odontomas, feline inductive odontogenic tumors, amyloid producing odontogenic tumors, cementomas, and giant cell tumors are types of odontogenic tumors. Surgical resection is the treatment.

Peripheral canine acanthomatous ameloblastoma (CAA) (a.k.a. acanthomatous epulis) may arise from the epithelial rests of Malessez, adjacent bone, and/or the periodontal ligament (PDL); have no hard dental tissue structures, aggressively invade bone, are benign, have a predilection for the mandibular incisor and premolar regions, and do not metastasize. They rarely transform to squamous cell carcinoma. Radiation can control 90% of ameloblastoma but 5% develop radiation necrosis and 5-20% will undergo malignant transformation at a later date. Therefore, surgical resection is often chosen unless the patient requires the dentition to assist the owner or to perform its duties. Complete surgical excision can resolve the issue. Surgical margins should be minimally 1.0-2.0 cm. A veterinary dentist/oral surgeon, we will utilize symphyseal sparing mandibulectomy and marginal rim excision techniques to preserve the function of the mandibular canine tooth/teeth mandibular symphysis, and ventral mandibular cortex if possible.

Peripheral odontogenic fibromas (POF) (previously known as fibromatous and ossifying epulides) are benign tumors often found in the premolar and incisor regions. Surgical resection is curative but it requires extraction of the involved teeth and complete excision of the periodontal ligament tissues. Surgical margins may be narrower compared to CAA.

Focal fibrous hyperplasia (a.k.a fibrous epulis) should not be confused with a POF as the focal fibrous hyperplasia is a "tumorous growth" that is reactive tissue.

Odontomas are of both epithelial and mesenchymal origin and are found in young animals. A complex odontoma has an amorphous mass of poorly differentiated mineralized material, and is rare. A compound odontoma has denticles (tooth like structures) in an unorganized, random, structure throughout the tumor. Odontomas are locally destructive and early recognition and excision is curative. Preservation of the cortical bone will allow functionality of the maxillofacial skeleton long term.

Feline inductive odontogenic tumors are rare. They are found in the rostral maxilla of young cats. They are locally invasive and early recognition and maxillectomy can be curative. The odontogenic epithelium is organized around a dental pulp-like stroma. Amyloid producing odontogenic tumors are rare, non-infiltrative, non-metastatic and locally expansive, destroying surrounding structures. Surgery can be curative.

Non-odontogenic tumors

The most common canine oral tumors are: malignant melanoma (30-40%), squamous cell carcinoma (20-30%), fibrosarcoma (10-20%), epulides (20-30%), osteosarcoma (<10%), and others (<5%). The most common feline tumors are squamous cell carcinoma (70-80%) and fibrosarcoma (13-17%). The majority of feline and canine oral tumors occur in middle aged and older patients. Other tumors have been reported but are rare (e.g., Plasmacytoma, mastocytoma, hemangiosarcoma, neurofribrosarcoma, lymphoma)

Canine oral malignant melanoma (MM) tends to occur in older patients and a male predisposition has been suggested. It is the most common oral tumor reported in the canine patient. Breeds with increased oral pigment or overrepresented. Amelanotic melanomas (1/3 rd of the melanoma cases) can make the histologically more challenging to diagnose; special staining may be utilized. In general, MM is highly metastatic and is presumed at the time of diagnosis. Tumors with dimensions < 2.0 cm tend to have a better prognosis. However, some well differentiated oral melanomas with low mitotic indices may not metastasize and could be treated with complete surgical resection alone. However, assessment by an oncologist is recommended to discuss immunotherapy.

Complete surgical resection and adjunctive radiation therapy, immunotherapy, or chemotherapy is often recommended. A melanoma vaccine (xenogenic human tyrosinase plasmid DNA) is available for adjunctive treatment (immunotherapy) following removal of macroscopic disease in order to treat presumed microscopic metastasis. The targeted antigen is a tyrosinase glycoprotein involved in melanin production on melanocytes.

Canine oral squamous cell carcinoma (SCC) is the second most common oral tumor in the dog. It is common in older patients and tends to metastasize late in the course of disease. Therefore complete surgical resection can have an excellent prognosis if identified early.

Feline oral squamous cell carcinoma (SCC) is the most common tumor in the feline oral cavity. Risk factors include smokers in the house, flea collars, and canned tuna/food. The most common site is the sublingual region. Mucosal ulcerations and secondary inflammation are often associated with SCC. A non-healing extraction site should have a high index of suspicion for SCC in an older cat and be biopsied accordingly. The tumor is invasive and local disease is often the cause of death. Surgery and adjunctive radiation therapy is the best treatment option at this time. The median survival time from the time of diagnosis is 30-60 days.

Canine oral fibrosarcoma is the third most common tumor in the dog. It tends to occur in large breed dogs and male predisposition has been suggested. They also occur in younger dogs. Metastasis is uncommon (<20% to the pulmonary parenchyma). These tumors can be reported as histologically low grade but biologically high grade. They may have a histologically appearing low grade tumor but the tumor is locally invasive and needs aggressive surgical margins.

Oral osteosarcoma is uncommon but carries a much better prognosis than appendicular osteosarcoma with complete excision.

Lingual tumors

Approximately 4% of all tumors are tongue tumors. Squamous cell carcinoma is the most common (50% of tongue tumors). Other tumors include myoblastomas, malignant melanoma, mastocytoma, leiomyosarcoma, hemangiosarcoma, hemangioma, rhabdomyosarcoma, etc. The rostral tongue tumors are generally recognized earlier and are in a more favorable location for resection. Dogs can function with large portions (entire body and leaving root) of the tongue removed. Temporary feeding tubes may be necessary while the patient learns to prehend food. Cats do not function as well and will need assistance with grooming and feeding tubes. Prognosis varies on the type and location of tumor.

Clinical signs of oral tumors

The malignant tumors often present with halitosis, ptyalism, oral hemorrhage, maxillofacial disfigurement (if large), and occasionally dysphagia and weight loss; or nothing at all and are found during an annual periodontal cleaning and oral exam. The non-odontogenic tumors, other than the canine acanthomatous ameloblastoma, tend to have few associated clinical signs until they are large. Oral tumors may have associated regional lymphadenopathy that represents reactive lymph nodes or metastasis.

Staging oral tumors

As with all tumors, staging is important. A biopsy (incisional or excisional) of the oral mass is necessary, complete CBC/Chemistry Panel/UA, as well as 3-view thoracic radiographs, and regional lymphocentrum evaluation is recommended.

When obtaining the incisional biopsy with many oral tumors the biopsy should be obtained from within the clinical margins of the tumor to prevent disruption and violation of clinically normal appearing tissue. There are tumor cells surrounded by a pseudocapsule and reactive zone. Biopsy at the tumor margin may open tissue planes and will need to be included in the surgical resection. Larger tumors may require multiple samples. Be aware that the center of the tumor may be necrotic and the surface of the tissue may be covered with hyperplastic gingiva, so be certain to obtain a deep and representative sample. Disposable punch biopsies can be used for softer tumors where as a Yamshidi needle or Michelle Trephine may be necessary for hard bone tumors.

It is known that fine needle aspirates and cytology can yield excellent staging results from lymph nodes. However, the maxillary lymphatics drain primarily to the parotid and medial retropharyngeal lymphocentrums and metastasis may be present WITHOUT any cancer found in the mandibular lymph nodes (the nodes accessible for aspiration.

Intraoral dental radiographs are imperative but advanced imaging (CT and MRI) can prove highly beneficial for surgical planning. Advanced imaging can be of great benefit when it comes to achieving clean surgical margins, particularly in the maxilla. Thereby, extending median survival times and diminishing local recurrence rates. Advanced imaging is the gold standard prior to surgery.

Treatment depends on the type of tumor, stage of tumor, location of tumor, and consultation with the owner. Surgical excision, radiation therapy, chemotherapy, vaccination (oral melanoma), cryotherapy, photosensitization, or combinations may be indicated. Many treatments often begin with surgical resection and surgical resection is still the treatment of choice for most tumors.

Treatment

A team approach consisting of dentistry/oral surgery and oncology is necessary to manage these cases. Publications have reported that many owners are satisfied with the outcomes of mandibulectomy and maxillectomy for oral tumors.

Mandibulectomy and maxillectomy can be described based on the location. The goal is to cure the patient with adequate tumor free margins with no metastatic disease. A collaborative plan with oncologists, radiation oncologist, and oral surgeon may be necessary. Palliative surgery and debulking surgery may also be elected in some cases.

Surgical margins are planned at least 2 cm beyond clinically abnormal tissue for most malignant tumors and 1 cm or more for benign oral tumors and in conjunction with imaging (CT, MRI, and/or intraoral radiographs).The soft tissues and bone are excised away from the tumor during excision. Tissues include the tumor proper surrounded by a pseudocapsule (intracapsular incision), reactive zone (marginal incision), and then normal tissue. A wide excision, necessary for malignant tumors, includes all the aforementioned tissues. A radical excision includes all the tissues and the supporting tissue compartment (mandible) such as in a total mandibulectomy. If tumors infiltrate the nasal cavity, the ipsilateral nasal turbinates are removed.

All bone margins are smoothed with a medium diamond bur prior to closure. The surgical sites are closed with poliglecaprone-25. Standard oral surgical principles are followed: 1) No tension of the mucoperiosteal flap 2) Suture lines over bone (soft tissue incisions wider than bone incision) and 3) Simple interrupted sutures 2 mm apart with 2 mm bites. However, with maxillectomy and mandibulectomy the decision to make the bone incision wider than soft tissue to facilitate suturing is used by some surgeons.

In general, cosmesis and function can be good for patients. However, a complete discussion with the owner always occurs. Owners are often pleasantly surprised at the functional and cosmetic outcomes.

References available upon request