The word “tumor” can be scary to many pet owners because the term invokes visions of malignant cancers. While some tumors are malignant, not all tumors in dogs and cats are malignant. In dogs, 50% of oral tumors are malignant, but the good news is 50% are benign and typically not life threatening. Even some malignant tumors can be slow growing and slow to spread to other parts of the body (called metastasizing) and, if caught early, can be successfully removed completely with surgery. Other malignant tumors respond very favorably to radiation or chemotherapy. In cats, however, most oral tumors end up being malignant (usually squamous cell carcinoma), further emphasizing the importance of early detection and treatment.

Early recognition, accurate diagnosis, and tumor staging are vitally important and significantly affect the patient prognosis. Some important criteria to determine are tumor type, tumor size, location, bone involvement, and evidence of metastasis. In general, the smaller a tumor is when diagnosed, especially if it is malignant, the better the prognosis and the more likely the mass may be able to be adequately removed surgically. Masses that may appear insignificant because they are small should be biopsied because the earlier the diagnosis, typically the easier they are to treat and the better they respond.

Initial diagnostic approach to oral tumors should include anesthetized oral exam of the mass: determine the tissue involvement (i.e., is it on a stalk—pedunculated or dispersed broadly throughout the soft tissues), careful measurement of the dimensions of the tumor in three dimensions, radiographs of the associated teeth/bone—ideally dental radiographs, careful examination of regional lymph nodes—fine needle aspirate if any are palpable, and mass biopsy. In general (these are not hard and fast rules), those tumors that are pedunculated or push teeth out of their normal position tend to be benign. Those masses that show bone lysis or invade soft and hard tissue without disrupting the normal location of teeth tend to be malignant. Good biopsy techniques will help give an accurate diagnosis. Adequate sample size and sample location is helpful to get a representative sample for histopathologic exam. 0.5-1.0 cm cubed sample taken from the middle or most representative area of the tumor, taking care not to incise into normal tissue, should be adequate. Also, take samples after all other dental surgery has been done or completely change out instrumentation to avoid potential iatrogenic spread of tumor cells. If possible, take digital photos of the mass before and after biopsy sampling and provide a copy of the photos to the pathologist along with a detailed description of any radiographic abnormalities and regional lymph node aspirates. Once the mass is evaluated histologically and the tumor type is determined, then further tests can be done if necessary to see the full tumor extent and if there are any signs of metastasis such as chest radiographs, abdominal radiographs/ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), and regional lymph node removal for more complete exam. Once the tumor is staged (see the World Health Organization Tumor Staging classification), then treatment recommendations/options can be discussed with the owner regarding prognosis, extent of surgery (if indicated), and quality of life following surgery.

In dogs, there are several benign oral tumors, from overgrown normal gum tissue (called focal fibrous hyperplasia) to benign tumors originating from the tooth structure (odontogenic tumors) to non-tooth origin tumors (such as papillomas—viral caused tumors). Most of these are treated by removing the mass with a very small amount of normal tissue around them +/- including the teeth they are associated with. In some cases, even benign tumors may invade the bone of the associated tooth it originated from and some bone removal may be necessary when removing the teeth. As long as these lesions are detected early, a small amount of bone removal combined with losing a few teeth, while not perfect, should not interfere with the pet’s overall quality of life.

Treatment for oral malignant tumors varies depending on the specific tumor type, size of the tumor, local invasion into the tissue surrounding the mass, and spread to distant tissues (metastasis). This further underscores the importance of oral biopsy, dental X rays, chest X rays, abdominal X rays or ultrasound, and evaluation of the regional lymph nodes that drain the area where the mass is located. If there is no evidence of distant spread of the tumor, surgery to remove the mass may be the best chance for a cure. Different oral malignancies require different amounts of normal surrounding tissue to be removed, called “margins,” to give the best chance of eliminating the tumor completely. Substantial amounts of both the upper and lower jaw can be removed when removing oral malignancies and these patients actually adapt quite well. In general, the smaller the malignancy and the more forward in the mouth, the easier it is to achieve “clean margins” and, consequently, a higher rate of success.
Some of the more common oral tumors to be familiar with include:

**Benign**

1. Focal fibrous hyperplasia (previously called gingival hyperplasia): Probably the most “benign” of gingival masses; however, these can be extensive in nature. Boxers, bulldogs, and other brachycephalic breeds seem to be the most represented. Excision of the redundant tissue is advised to help prevent “pseudo-periodontal pockets” along the surfaces of the adjacent teeth that collect food and debris, potentially leading to periodontal disease. Gingival hyperplasia may be induced by certain drugs such as phenytoin and cyclosporin. Azithromycin has been proposed to counteract the effects of cyclosporin induced gingival hyperplasia and some veterinary dentists have advocated using an azithromycin gel topically on a daily basis. There are no controlled studies to report the effectiveness of this to date. Reduction of the dose of cyclosporin to the lowest effective dose may be beneficial.

2. Peripheral odontogenic fibroma (previously called fibromatous epulis)—some of these mineralize internally and may be called “ossifying epulis”: These tumors arise from the periodontal ligament of the associated tooth and may recur with incomplete excision. If the mass was excised at the time of biopsy, careful monitoring is advised. If the mass recurs within a short amount of time (less than a year) then excision of the mass along with extraction of the associated tooth and alveoloplasty should be curative.

3. Acanthomatous ameloblastoma (previously called acanthomatous epulis and adamantinoma): For the canine acanthomatous ameloblastoma (CAA), the breeds most predisposed (in order) were the golden retriever, Akita, cocker spaniel, and Shetland sheepdog. This is contradictory to another study of canine epulides by Yoshida et al. in 1999, who reported the Shetland sheepdog to be much more predisposed than any other breed. The most common location of the CAA was found to be on the rostral mandible. In general, the CAA is technically a benign tumor in the respect that this tumor has never been reported to metastasize, but they are considered to be locally invasive into surrounding bone and therefore treatment dictates excision of the mass with at least 0.5cm margins of clinically and radiographically normal tissue. Clean surgical margins equates to an excellent prognosis with a very low incidence of recurrence (less than 2%). These tumors are also radiosensitive and those that cannot be resected surgically should respond well to radiation therapy. One recent study by Kelly et al. reported in 2010 also found good results with intrallesional bleomycin injections.

4. Sublingual granuloma: Hyperplastic mucosa from repeated trauma under the tongue or in the cheek mucosa. Usually a response to this tissue getting caught between the occlusal surfaces of the teeth when chewing. These have been referred to as “gum chewers lesions” previously. Excision is advised, although some may recur.

5. Odontoma (compound or complex): Benign abnormal division of cells of tooth origin. The compound odontoma will radiographically appear like a sac of multiple teeth whereas the complex odontoma will appear radiographically as a soft tissue density mass within the bone. Both are treated the same, open exploration with curettage of all contents and cavity lining. Submission of the contents and/or lining is advised to confirm the clinical diagnosis.

6. Cysts (dentigerous, radicular, etc.): Unerupted teeth are usually the etiology of epithelial lined cysts within the mandible or maxilla. The mandibular first premolar teeth in brachycephalic breeds are commonly unerupted. Dental radiographs of all patients, even in areas where there are clinically missing teeth, will help detect these unerupted teeth. Extraction prior to cyst development can be very beneficial. Clinically, dentigerous cysts appear as soft, fluctuant swellings in the gingiva or mucosa and often have a bluish tint. Fluid aspirated with usually straw colored +/- blood. The dentigerous cyst develops from the dental sac surrounding the crown of the unerupted tooth. Treatment is aimed at open exploration, removal of the unerupted tooth and the cyst lining and closure of the defect. Any removed cyst lining should be submitted for histopathology.

**Malignant**

1. Malignant melanoma (MM): The most common oral malignancy in dogs’ mouths. These are locally invasive (57% involve bone) and relatively quick to metastasize (50%–75% metastasize to regional lymph nodes and lungs). Regional lymph nodes should be aspirated or biopsied, as lymph node size is an inaccurate indication of metastasis, along with chest radiographs to accurately stage this neoplasm prior to surgery. MM less than 2cm carry a more favorable prognosis. Surgical excision should include 1.5-2cm of clinically and radiographically normal tissue surrounding the mass. Careful follow-up is advised for local recurrence and metastatic development with lymph node palpation and chest radiographs every three
months for 18 months following surgery. Adjunctive therapy such as radiation, immunotherapy, or chemotherapy may be helpful. Consultation with a veterinary oncologist is advised. Be aware that recently, a “low-grade” form of oral melanoma has been described with a very favorable prognosis (Esplin 2008).

2. Squamous Cell Carcinoma (SCC): The most common malignancy in the oral cavity of the cat and the second most common oral malignancy in the dog. Relatively slow to metastasize (except the tonsillar form in cats) and typically spreads to the lungs (20%–30%) and regional lymph nodes. These tumors can be locally invasive and most (75%) show local osteolysis. Surgical excision should include at least 1cm (more if possible) of clinically and radiographically normal tissue surrounding the mass. The prognosis is good for surgery with clean margins, better in the mandible (10% local recurrence) than the maxilla (30% recurrence rate locally). There is a poor prognosis for cats with tonsillar SCC or caudal sublingual SCC. Be aware of the papillary SCC, which can occur in very young dogs. This tumor is locally invasive, but carries a very good prognosis with clean surgical margins. Consultation with a veterinary oncologist is advised.

3. Fibrosarcoma (FSA): In the oral cavity, these tumors are typically slow growing and slow to metastasize, but are very locally invasive. Approximately 25% metastasize to the regional lymph nodes and 6% to the lungs. Surgical excision should include 2cm of clinically and radiographically normal tissue surrounding the mass. Even with clean margins, local recurrence (46%) is common. Be aware of the Histologically Low Grade, Biologically High Grade FSA: This is a very invasive and aggressive form of FSA that affects relatively young dogs (golden retrievers) and histologically may appear to be a “well differentiated fibroma.” Consultation with a veterinary oncologist is advised.

4. Osteosarcoma (OSA): A less common malignancy in the dog and cat that is typically slow to metastasize in comparison to the osteosarcoma of the appendicular skeleton. Surgical excision with 1–2cm margins are advised and if margins are wide and clean, a good prognosis is expected. Careful follow-up for local recurrence and evaluation of local lymph nodes as well as periodic chest radiographs are advised. Consultation with a veterinary oncologist is also recommended.

5. Plasmacytoma: Extramedullary plasmacytomas can occur in the oral cavity of dogs and rarely metastasize, however, they can be locally invasive. Surgical excision is the treatment of choice with 1cm margins of clinically and radiographically normal tissue surrounding the mass. If clean margins are achieved, there is a favorable prognosis.

An excellent resource is the Veterinary Society of Surgical Oncologists website: www.vsso.org

***If you notice, many of these tumors look alike, therefore...the bottom line is to look often, detect early, and treat as soon as possible when it comes to oral tumors.

References