As veterinarians we encounter potential cancer patients on a frequent basis. Many of these pets present with lumps and bumps that owners have recently noticed or that you identify during your physical exam. Unfortunately, some of these masses will be malignant in behavior. It is your challenge to determine if these masses are of concern or not.

Masses palpated both internally and externally originate from cell types that can be classified as mesenchymal, epithelial, or round cell. To determine if these cell types are benign or malignant we must look at their level of differentiation. Typically, cells that are well differentiated (look close to “normal”) have a less aggressive behavior; whereas, undifferentiated cells tend to be aggressive in nature. Sampling the mass is the most direct approach in identifying the cell type and behavior. There are several facets to consider in approaching the oncological patient such as diagnosing, staging, treating (local vs. systemic), monitoring response to treatment, and overall prognosis. This article, however, will focus on tumor sampling strategies and thoughts that should precede any actions.

Biopsy techniques can be placed into 2 main categories: incisional and excisional. Incisional biopsies are tissue samples taken from within the mass leaving the majority of the mass for definitive treatment once a diagnosis has been made. Excisional biopsies remove most or all of the mass regardless of cell type and behavior. Incisional biopsies are indicated anytime knowledge of the offending tissue has the potential to alter definitive treatment, whereas, excisional biopsies are indicated when your treatment will not change based on cell type or behavior. Sometimes owners’ preference or financial constraints dictate the type of biopsy as well.

Continued on page 2
Many pet owners do not understand the thought, planning, and staging that go into a treatment recommendation and just want to have the mass "removed." It can be a challenge to take the diagnostic steps that you feel are appropriate prior to surgical or medical intervention if the owner resists. Educating the owner well on the value of doing a systematic and systemic workup of their pet will often put you both on the same page and heading toward the same goals. Biopsy results are invaluable in formulating future treatment recommendations.

Tru-cut needle biopsy, Baker's biopsy punch, and wedge biopsy are ways to obtain incisional biopsies on soft tissue masses. The Jamshidi bone marrow biopsy needle and Michele trephine are instruments that can be used to obtain incisional bone biopsies.

Ideally, soft tissue masses should be biopsied at the peripheral margin of the mass with a portion of abnormal and normal tissue. This is not always feasible, in which case you should take at least 2-3 biopsies from firmer regions of the mass and a portion of its outer vascular "rim." A punch biopsy is by far preferred for most masses because of the large sample obtained, however, on masses that are highly vascular it is preferred to use smaller biopsying instruments such as a needle or tru-cut. Ulcerated masses are usually best suited for wedge biopsy to ensure a representative sample beyond the inflammation. Healing of the incisional biopsy site is rarely an issue but should be discussed as a potential complication.

Most diseased bone can be easily biopsied with a Jamshidi needle, which has the advantage of leaving a smaller void in the bone in comparison to a Michele Trephine. The tract left in the bone after a biopsy can lead to a pathological fracture. This risk should be discussed with the owner. Unicortical biopsies have the potential to lessen this risk. Fine needle aspiration can also be considered in bone tumors.

There are four main types of excisional biopsies: an intracapsular approach where macroscopic disease is left behind, a marginal approach that leaves microscopic disease, a wide resection that leaves no local disease, or a radical resection where the entire compartment or organ is removed with the mass. Veterinarians need to be very clear to the owner that the goal of the marginal or intracapsular resection is to gain a diagnosis, not a margin. In most cases a second surgery or other treatment modality will likely be needed.

Prior to biopsying a mass you need to plan your biopsy site. All biopsy tracts will need to be placed in locations where they can be easily included in any subsequent definitive resections. This is fairly straightforward with cutaneous masses, however, masses in and around the oral cavity should be biopsied through the oral mucosa if possible to preserve the hairless skin for definitive surgery.

Certain masses such as those involving the thyroid gland should be biopsied with caution. Thyroid carcinomas can be extremely vascular with cavernous regions and can bleed profusely if biopsied in the wrong location. For this reason needle biopsies or aspirates are the recommended sampling techniques for thyroid masses. Keep in mind that the smaller the sample, the lower the diagnostic yield, so resubmission may be needed.

Drains should not be used when performing a biopsy on any potentially neoplastic mass as they can facilitate seeding of neoplastic cells to nearby tissue. Drain tracts dramatically increase the size of the potential surgical or radiation.

All biopsies should be submitted to a veterinary pathologist. Make sure to include a complete history along with a request for evaluation of vascular or lymphatic invasion, mitotic index, and grade, if applicable.
Advances in Craniocervical Surgery was one of the main highlights of the American College of Veterinary Surgery Symposium this year.

Chiari Malformation

Chiari Malformation is the most common craniovertebral malformation seen in dogs. A malformation of the caudal calvarium causes cerebellar compression and cerebellar herniation through the dorsal aspect of the foramen magnum. A secondary spinal cord compression occurs interfering with normal CSF flow and causes the formation of a syrinx or abnormal accumulation of CSF within the spinal cord. These changes produce a variety of clinical signs ranging from scratching at the ears to cervical pain and neurological deficits.

The Cavalier King Charles Spaniel is the most common breed affected. Surgical treatment has previously involved Foramen Magnum Decompression (FMD). This technique has a 30% failure rate due to scar tissue formation across the site of decompression.

A new procedure called Cranioplasty eliminates this problem. The exposed cerebellum is covered with a titanium mesh following FMD. In recent a study of 28 dogs 91% were improved and had no recurrence of their clinical signs.

Mast cell tumors are the most common skin tumor we see in dogs. Despite how often we see these tumors their treatment course and clinical outcome can be as varied as the appearance of the tumors. Grade and stage of the tumor are helpful in guiding us in prognosis and treatment course - but is there more we can do to help guide us in treatment?

As many of you know the grading scheme for mast cell tumors has limitations and the majority of mast cell tumors we see are grade 2. Some dogs with grade 2 tumors do well and are cured with surgery alone and some develop distant spread within months – what are we missing?

A recent report reviewed mitotic index and this has helped us greatly in predicting prognosis – but this is only one marker of cellular proliferation.

There are two new mast cell tumor panels that are available at Colorado State University and Michigan State University diagnostic labs. These panels evaluate the tumors with Ki67, AgNORs, PCNA, c-kit staining pattern and evaluate for the c-kit mutation. These panels provide a wealth of information about aggressiveness of the tumor and can help guide us in treatment of patients with mast cell tumors.

For more information and cost of these panels please visit the CSU or MSU diagnostic lab websites:

http://www.animalhealth.msu.edu

and

http://www.dlab.colostate.edu

Mast Cell Tumor Panel
Treatment Guidelines
from Michigan State University
Paws For A Cause A Huge Success

On October 2, more than 500 dogs and their owners walked through Falls Park to take a stand against cancer. Together, we raised over $36,000 for the American Cancer Society. One of our bravest oncology patients, Sydney Copper, raised $1,411 through her personal team.

Also helping us raise awareness of the issue of cancer in pets were representatives for Chase Away K-9 Cancer, a fundraising arm of ACVIM. Upstate Vet Specialists has teamed with this group to create a beautiful calendar featuring inspiring stories of cancer survivors we have treated here. If you are interested in purchasing a calendar, it is not too late—contact Dr. Sarah Kraiza here at UVS. Calendars are $15 and make a wonderful holiday gift!

Mark your calendars now for Paws For A Cause on October 1, 2011!