

Prepping a patient for an oncology referral
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For the owner motivated to seek consultation of an oncologist, there are a number of things the practitioner can do to prepare the patient, and owner, for the referral. The most important contribution to this preparation is some pre-referral staging.

Staging reflects the steps taken to determine both the local and distant extent of a tumor. Staging often includes a more global assessment of a tumor-bearing patient's health. The purpose of staging a cancer patient is to ensure that the right treatment options are offered to the right patient for the right reasons, and the more the patient has been staged, the sooner the conversation with the client about options can be had. Many elements of the staging of a cancer patient can, and arguably should, be done by the primary care veterinarian before their patients see a veterinary oncologist. The goal of this presentation is to convince the private practitioner, be they a generalist or specialist other than an oncologist, that there are advantages to staging patients before an appointment with an oncologist.

The World Health Organization (WHO) has a staging scheme for nearly all veterinary and human tumors, a scheme often referred to as the TNM system, where T is for the primary tumor, N is for lymph nodes, and M reflects distant metastasis. While there are criteria used to define a particular stage for individual tumors, with the stage of potential prognostic benefit, it is my opinion that the value of the TNM system is as a general guideline for the staging steps.

For most patients, the staging process starts with a thorough physical examination, although obtaining a thorough history to determine if the patient is otherwise well or has problems that are a consequence of the tumor, or something unrelated, is also an important early first step. Apart from the primary tumor, the patient needs to be carefully examined for other masses/lumps/bumps that could reflect unrelated tumors, or for other diseases that could play a role in defining treatment options or modify an owner's enthusiasm for pursuing treatment of the primary tumor. Often overlooked on the physical examination is a rectal exam; over the years, the author has seen many patients referred for one tumor that had undetected (for want of a rectal exam) anal sac carcinomas.

The staging elements of the tumor that are critical to deciding treatment options are the tumor type, and often the tumor grade, a feature of a tumor usually established by a pathologist looking at tissue sections. Tumor grade is used by oncologists to make assessments of likely tumor behavior, both from a local standpoint (recurrence) and metastatic potential. Defining a tumor can start with a needle aspirate to establish a general tumor type, or establish a definitive diagnosis (e.g. lymphoma, or mast cell tumor). While a needle cytology can in some cases be adequate to outline treatment options, in some cases, the tumor grade is needed to better define treatment options. For example, needle cytology is often enough to establish a mass as a mast cell tumor (MCT), but often histologic examination is needed to grade that MCT. For dogs with low-grade MCT, surgical resection is often sufficient as sole treatment, especially if clean margins are obtained, while for high-grade MCT, surgery may be insufficient as a single treatment approach. Thus, for MCT or other tumors in challenging locations, or for tumors that could require expensive treatment with the potential for morbidity, there can be value to obtaining an incisional-type biopsy before resection so that clinicians, and owners, can have a clearer perspective on what may be needed after surgery. In some cases, the results of that biopsy may have an owner decline aggressive treatment (e.g. for a high-grade MCT with a high mitotic index and likelihood of aggressive behavior). Needle aspirates and incisional-type biopsies are easily in the armamentarium of nearly all private practitioners.

In some cases, routine H&E staining will be unable to define the specific tumor type, and pathologists will suggest additional stains with the hope of better clarifying the tumor type. If an owner is interested in keeping all treatment options on the table, such stains should be requested. For example, a spindle cell tumor in the mouth of a dog

may be a fibrosarcoma or melanoma. Treatment approaches/options can differ between the tumor types, and the tumor types may be distinguished by use of special stains on the biopsy samples. If results of special stains are available before an appointment with an oncologist, the oncologist can have confidence in her/his treatment options as being appropriate for the specific tumor type, and implementation of treatment may be expedited by not having to wait on results of special stains. The value of special stains may be diminished if an owner is not interested in pursuing treatment specific for a given tumor type.

Defining the immunophenotype (B-cell or T-cell) of canine lymphoma is becoming increasingly useful to define treatment options for individual patients. Beyond providing prognostic information (B-cell carries a better prognosis than T-cell in the population of affected dogs), the immunophenotype can suggest to an oncologist that some specific drugs may be better for a given patient. For example, there is a growing body of evidence suggesting that lomustine is a good drug in dogs with T-cell disease. On the other hand, response rates to Tanovea are better in dogs with B-cell disease than T-cell disease. Establishing the phenotype is easily accomplished by submitting blood (if there is peripheral lymphocytosis from lymphoma or leukemia) or lymph node aspirates suspended in saline to a performing laboratory; results can be available in as soon as 3 days depending on the laboratory. Flow cytometry can be helpful in distinguishing lymphoma from leukemia, and for dogs with acute leukemia, the diagnosis made before referral is very helpful to the oncologist to be able to present treatment options, and prognosis. PARR (PCR for antigen receptor rearrangements) can also establish phenotype from lymph node aspirates (stained or unstained) on a slide. We are more commonly seeing lymphoma-bearing dogs at the VTH that have had phenotype established by their regular veterinarians, emphasizing the accessibility of the testing to general practitioners.

Another element of the tumor that is often needed to define treatment options is imaging, particularly useful to define the local extent of a tumor, which may be important with large, fixed tumors or tumors in anatomically complicated areas. Computed tomographic (CT) scans are excellent strategies for helping define the local extent of a tumor, but sometimes good information can be obtained by use of ultrasonography, a technology now common in the clinics of private practitioners. Ultrasonography may be helpful for determining the extent of an intramuscular mass, or a fixed subcutaneous mass, or others, and should be considered when CT is not readily available, especially if a surgical intervention is a possibility for a given patient- there can be advantages to knowing if a mass appears well-delineated from surrounding tissues, or has features suggesting it is more locally extensive/invasive than appreciated from a physical examination. Ultrasonography may help with aspiration or biopsy of tumors in some cases. One word of caution regarding CT scans before referral to an oncologist- if radiation therapy is an option for a patient, some radiation therapy (RT) facilities will require their own CT scans to be able to plan RT protocols, risking a client having to pay for two CT scans. If there are questions or uncertainties regarding the value of a CT before referral, consultation with the oncology service is advised.

Other tools that are occasionally useful for better defining the primary tumor include nuclear scintigraphy (thyroid tumors, osteosarcomas) or magnetic resonance imaging (brain or other central nervous system tumors), but these are going to be beyond the scope of most general practitioners without referral.

Aspiration of regional lymph nodes is another staging element that can be accomplished in many/most patients before referral to an oncologist. Attempts to aspirate regional lymph nodes should be done in most, if not all, patients with tumors with any metastatic potential. A key to keep in mind is that one cannot reliably assess the status of a lymph node by physical examination. A normal lymph node can have metastatic cells, and an enlarged node may be reactive to tumor-related inflammation. Biopsy of a regional node is also a good strategy for evaluation of nodal metastasis and might be more highly considered if a patient is undergoing a biopsy of the primary tumor. If the location of a draining node is not known, there are maps that are readily available that illustrate the likely drainage pattern of the superficial lymph nodes. The practitioner should be aware that recent studies are demonstrating the regional lymph nodes are not often the first lymph nodes to which a tumor will spread, and for tumors in some areas, drainage could be to multiple regional lymph nodes.

The assessment of a patient for distant metastasis depends on the tumor type as certain tumors display “typical” or expected patterns of metastatic behavior. For example, MCT have a predilection for metastasis to regional lymph nodes, liver, and spleen. Complete staging for a dog with high-grade MCT might then incorporate imaging and aspiration of the liver and spleen for cytology. Aspiration of target organs for a given tumor type may be in the wheelhouse of many practitioners and could be considered then before a patient sees an oncologist and we are seeing more patients that have had aspirates of liver and spleen or other organs/tissues prior to referral to the VTH.

It is the desire of most oncologists to have thoracic radiographs, or sometimes thoracic CT scans, of virtually all patients before developing a treatment plan. Detection of changes consistent with pulmonary metastatic disease can drastically alter treatment options or convince owners not to pursue treatment of their tumor-bearing animals. Thoracic radiographs are important even for those patients with tumors unlikely to exhibit pulmonary metastatic behavior as the physical examination is an insensitive tool for the detection of intra-thoracic disease. In our hospital at WSU, it is somewhat common for a patient to have evidence of a second, unrelated tumor emerge from thoracic imaging, or even to see evidence suggestive of metastatic disease of an unknown tumor. Most oncologists would view the costs of a thoracic radiograph as relatively inexpensive insurance that treatment options proposed for a given patient are appropriate, especially if the proposed treatment is expensive and/or has potential for significant morbidity. Thoracic radiographs can also be a useful baseline to monitor treatment responses in patients with aggressive tumors (e.g. hemangiosarcoma, osteosarcoma, others). For me personally, it is a distressing conversation that follows detection of pulmonary metastatic disease on plain thoracic radiographs in a patient that has come from several hours away to be seen at the WSU-VTH when I know that had the radiographs been taken before the owners made the drive, they would have at least had the option of not coming to Pullman. In the worst of scenarios, those patients end up in Pullman for euthanasia after a thoracic radiograph documents metastatic disease, or an unrelated tumor or another serious health problem.

Lastly, results of a CBC (which should include examination of a blood smear), biochemical profile and ideally a urinalysis should accompany a patient at the time of their appointment with an oncologist. While these tests are not always going to reveal information about the primary tumor, they could suggest other, concurrent health problems that could alter treatment recommendations, or change drug dosages or other aspects of a treatment protocol.

If one considers the WHO TNM staging scheme as a guideline for tumor staging, I hope it is apparent that there are many staging steps that a private practitioner could complete before their patients see an oncologist. When talking to private practitioners about their patients they would like to refer, I have suggested for many years that everyone wins when they are staging their patients as much as possible prior to referral: their clients win because they are seeing an oncologist for the right reasons (e.g. an owner that would not be inclined to pursue treatment in the face of metastatic disease or a tumor with a likelihood of aggressive behavior), the oncologist wins because time can be spent at the outset articulating appropriate treatment options based on the known stage of the patient, and you the practitioner win because you keep the revenue from the staging procedures in your hospital. If there are questions about what staging can/should be done before referral, it is reasonable to consult with your oncologist/oncology practice.

References available upon request.