Appendicular Osteosarcoma in Dogs

Osteosarcoma is the most common bone tumor in dogs. Although it is mostly a disease of older large or giant breed dogs, it can affect dogs of any size or age. Osteosarcoma may be found in many areas, but it most commonly appears in areas bordering the shoulder, wrist and knee. The first step in diagnosing osteosarcoma and other primary bone tumors is to take radiographs ("x-rays") of the affected limb. A careful physical exam is also important to assess the overall health of your dog.

Next, radiographs ("x-rays") will be taken of your dog's chest to see if the tumor has spread to the lungs. It is important to find out whether the cancer has spread (metastasized) to the lungs, as treatment options and prognosis are very different if lung metastasis has occurred. In the initial diagnostic stages, we may also aspirate local lymph nodes and any skin masses, or perform an abdominal ultrasound. Again, these steps are necessary in order to assess the spread of the cancer.

Another diagnostic test that may be performed is a bone scan. This test, which requires an overnight stay in the hospital, will help determine whether the tumor has spread to other bones and how much of the bone where the primary tumor is located is affected. This test is most often done on patients who will undergo a treatment that spares the affected limb, and is not required for every patient.

To obtain a definitive diagnosis, it is necessary to aspirate the tumor with an ultrasound-guided needle or perform a bone biopsy in order to attempt to identify the type of tumor. These procedures require sedation or anesthesia. There is often a large amount of bony reaction associated with this type of tumor, so it can be difficult to obtain an adequate sample of the actual tumor cells. Additionally, small samples are taken in order to minimize the spread of the tumor cells along the biopsy pathway and to avoid fracturing the bone. For these reasons, the biopsy procedure does not always yield a diagnostic sample. Even though only very small samples are taken, and bone biopsies are performed with the utmost care, this procedure always carries a small risk of fracturing the bone.

The tumor must be removed from your dog's leg. Aside from the possibility that the cancer will spread, the tumor is painful, and once it has destroyed enough of the bone, even normal activities such as walking or running can cause the bone to break. The standard treatment for an osteosarcoma is the amputation of the affected limb. Most dogs recover quite well from this procedure and are running and playing in a very short time.

Dogs who have other orthopedic problems or who are obese may not be good candidates for amputation. If this is the case, we may be able to offer your dog a limb sparing procedure. In this procedure, the tumor is removed and the bone is replaced either with another bone from your dog or with a bone from a bone bank. This operation cannot be performed in all locations and the tumor must be of a relatively small size at the time of diagnosis. Because of the high complication rate, amputation may eventually be necessary.
If neither amputation nor a limb sparing procedure is possible or desirable, another option is to attempt to relieve pain with palliative radiation therapy. Although palliative radiation does not generally increase a dog's survival time, in about 75% of dogs treated it does alleviate the pain caused by the tumor. Radiation therapy requires one treatment per week for four weeks, and these are administered while the patient is under general anesthesia.

Chemotherapy is an important follow-up step in the treatment of osteosarcoma. Though we may not have found gross evidence of the spread of tumor in your dog, it is estimated that over 90% of dogs with this type of tumor have microscopic spread before amputation or limb sparing procedures are performed. Although chemotherapy has not been shown to be very effective in treating osteosarcoma when there are visible signs of spread, it is very effective in treating microscopic disease. The protocol we currently use requires six treatments given three weeks apart. Chemotherapy as a follow-up treatment increases the median life expectancy to about one year. The median survival time with amputation alone is about three months. By two years 10-20% of the dogs who have received chemotherapy appear to be free of cancer. Most dogs tolerate the therapy very well and experience few side effects. The possible risks of treatment will be discussed with you, and you can also refer to the hospital's handout on chemotherapy. This handout is designed to answer some of the basic questions relating to canine appendicular osteosarcoma. Your dog's particular situation may vary. If you have any questions please ask us; we will be happy to answer them to the best of our ability.