



at the heart of critical care

ANIMAL EMERGENCY CENTER

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BONE CANCER IN DOGS

Introduction

Approximately 85% of bone tumors in dogs are osteosarcomas (*osteo = bone, sarcoma = cancer*). Osteosarcomas are highly aggressive tumors, characterized by painful local bone destruction and distant metastasis (spread to other organs). Osteosarcoma commonly affects the **limbs** of large or giant breed dogs, but can also occur in other parts of the skeleton (skull, ribs, vertebrae, pelvis). The biological behavior, prognosis, and treatment of bone tumors depends on tumor type, primary site (location), and extent of disease (stage). Therefore, various diagnostic tests such as radiographs (X-rays), blood tests, and a biopsy are required to determine the most appropriate treatment.

Clinical signs

The signs associated with a bone tumor may be nonspecific. Tumors in the limbs often cause various degrees of lameness and pain. A firm swelling may become evident as the tumor size increases. It is common for pain to be intermittent initially, and it may improve with pain medications prescribed by your veterinarian. As the degree of discomfort increases, it can cause other signs such as irritability, aggression, loss of appetite, weight loss, sleeplessness, or reluctance to exercise. Other clinical signs may vary, depending on the primary site and involvement of underlying structures.

Diagnosis and work-up (staging)

Initial evaluation of a dog with a suspected bone tumor often includes: complete physical examination with orthopedic evaluation, blood tests, X-rays (of both the affected site and the lungs), and a [biopsy](#). The biopsy can be *incisional* or *excisional*. An incisional biopsy is performed for diagnosis only. A small sample of the tumor is removed to determine the specific tumor type. An excisional biopsy involves removing the entire tumor, both for diagnostic as well as therapeutic purposes. Definitive surgery may be performed without a prior biopsy if the age, breed, location and appearance of the tumor are all very suggestive of osteosarcoma. The work-up and staging are important for two reasons: it is necessary to determine the tumor type and extent of the cancer, but also provides the oncologist with information regarding the dog's general health and may identify concurrent medical, bone/joint or nerve/spinal problems, all of which may influence the treatment recommendations and prognosis.

Treatment of primary bone tumors

As stated above, the treatment recommendations for bone tumors depend on multiple factors, and a complete physical examination and additional testing may be necessary to accurately determine the most appropriate treatment for an individual dog. Limb osteosarcoma is very painful because of invasion and destruction of normal bone.

These tumors are also highly metastatic (likely so spread to other organs), and the average dog with appendicular osteosarcoma will live only 4 months if treated with surgery alone. [Surgery](#) usually involves amputation of the affected limb, but [limb sparing procedures](#) may be an option in selected cases. *Amputation is almost always well tolerated by the patient – dogs with 3 legs can do virtually everything that 4-legged dogs can do.* The surgery serves two purposes; it removes the primary tumor, which is necessary for cancer control, but it also **removes the source of pain, and may therefore dramatically improve quality of life.** In patients where surgery is not possible, a conservative and well tolerated form of [radiotherapy](#) can be considered. Radiotherapy has the potential to significantly improve the degree of discomfort in approximately 75% of dogs, and the pain control lasts for an average of 4-6 months.

The most common cause of death is lung metastasis (spread), because of this, systemic [chemotherapy](#) is recommended following surgery for dogs with appendicular osteosarcoma. Chemotherapy is unlikely to cure most dogs with osteosarcoma, but can *prolong a good quality* survival. We currently use injectable medications given once every 3 weeks for a total of 4 treatments. Most dogs tolerate this chemotherapy well, with some dogs experiencing mild, self-limiting side effects such as depressed appetite, nausea, occasional vomiting and diarrhea for a few days. Less than 5% of dogs will experience severe side effects requiring hospitalization. If your dog's side effects are severe and compromise his/her quality of life, steps can be taken to prevent these side effects such as giving anti-vomiting medications. Please see the client handout [CHEMOTHERAPY IN PETS](#) for more detailed information about this form of treatment.

There is some new information that a class of drug called the **bisphosphonates** may be capable of inhibiting the growth of human and canine osteosarcoma cells in the laboratory, and may increase the effectiveness of chemotherapy as well. Owners may consider the addition of a bisphosphonate drug such as **alendronate (Fosamax)** to standard chemotherapy.

Following the completion of chemotherapy, we recommend pursuing every-other-month rechecks to insure that there is no evidence of recurrence or metastasis. The average survival time in dogs with osteosarcoma treated with surgery and chemotherapy is approximately 1 year, however 25% of dogs may live 2 years or longer.