



Canine Osteosarcoma

Osteosarcoma is a highly aggressive, malignant bone tumor that invades and destroys normal bone. This process is painful for the patient, and if the tumor is left to grow unchecked, the tumor will weaken the normal bone and may cause it to break.

Osteosarcoma usually also spreads (metastasizes) to other organs. The most common sites are the lungs and other bones. Osteosarcoma most often affects limb bones; the upper limb/shoulder area, the area just above the front paws, and the sites just above and below the knee are the most common locations. However, these tumors can affect any location, including the spine and jaw.

Clinical signs depend on the tumor's location, but most patients come in for bony swelling, pain, and/or lameness. Usually, other causes of these clinical signs are ruled out and radiographs (x-rays) are taken. Osteosarcoma often has a characteristic appearance on x-ray films. Next, a needle aspirate and/or biopsy sample is taken and submitted to a cytologist or pathologist for diagnosis.

Staging means we perform a series of diagnostic tests to assess the health status of a patient prior to treatment and determine the stage of the cancer, which is to say we determine where it has spread in the patient's body. This is important to determine optimal treatment for an individual patient, provide information to you the owner about expected benefits and risks and help us monitor a patient's progress. Staging for osteosarcoma minimally includes routine blood work, urinalysis, 3-view chest x-rays or CT scan (to look for metastatic disease), and palpation and evaluation of the other bones.

If it is at a site amenable to surgery and there is no evidence of spread to other locations at diagnosis, we recommend surgery as part of treatment. Osteosarcoma is an aggressive lesion that usually affects the limb bones, so this usually means amputation of the affected limb. Most dogs do fantastically well on only 3 limbs. Surgery is usually quick and routine, and dogs are up and running around in a matter of a few days. There is a procedure known as limb sparing which can be performed in specific situations. However, these are expensive procedures and are often fraught with complications. Thus, they are rarely recommended.

If surgery is not an option, radiation is a second consideration. We often use radiation with palliative intent, meaning we use it to decrease the pain of the primary tumor. There may be some treatment effect on the tumor itself, but the purpose is pain control. Radiation is often given in a few large doses. It can help with pain in a matter of days to weeks and can control pain in addition to pain medications for months. However, there is potential in the future that the tumor site will fracture and amputation would have to be considered at that time.

It is important to understand that both surgery (amputation) and radiation are considered palliative measures. Their purpose is actually to alleviate bone pain for the patient and improve quality of life. However, even with amputation, survival is still short because the tumor will usually spread to the lungs even after the tumor has been removed. Patients treated with surgery alone survive, on average, only about 4 to 5 months. Thus, we almost always recommend chemotherapy in addition to surgery.

We treat canine patients differently than doctors treat human patients in that we consider quality of life imperative for our patients as we cannot ask them permission to treat. There are always risks associated with chemotherapy, but we aim to minimize those risks through preventive measures (blood work, preventive anti-nausea drugs). We aim to keep the risk of your pet becoming sick enough from chemotherapy to require a hospital visit to 5% or less. Most patients experience no or mild side effects, which may include temporary nausea, decreased appetite, vomiting, lethargy, or diarrhea. A few patients experience moderate self-limiting effects (10 to 15%) that are mitigated with preventive antibiotics and/or anti-nausea or anti-diarrhea drugs given for a few days.

We do not expect to cure most of our patients. About 20% enjoy long-term survival (>2 years after diagnosis). Most cancer patients are cancer patients for life. With chemotherapy, the average patient survives 10 to 14 months while enjoying a good-to-excellent quality of life for the majority of that time.

Three chemotherapy agents are most commonly used: Doxorubicin (Adriamycin), Carboplatin, and Cisplatin. The optimal protocol has not been determined, and treatment will be tailored to best meet the needs of your pet using one or a combination of these drugs. Additionally, we often recommend oral medications used to improve life quality and hopefully slow growth and spread of disease.

Chemotherapy is usually given on an outpatient basis. It is administered intravenously and is given every 2 to 3 weeks for 4 to 6 treatments. A week after treatment, we perform a quick complete blood count (blood work) to ensure the dose was in the right range (it can vary from treatment to treatment and from patient to patient). After the final dose, or if there are concerns during treatment, we repeat chest x-rays and use them to monitor treatment progress and effect.

When osteosarcoma arises in sites other than the limb bones, outcome and treatment recommendations will vary depending on the site. Mandibular tumors do better; while rib and vertebral tumors often do worse. Surgery and radiation are often part of treatment, and chemotherapy is recommended based on the situation and the site.