



OSTEOSARCOMA

Osteosarcoma is the most common type of bone tumor in dogs. This cancer most often affects large, middle-aged dogs over 40 pounds, but it can affect any age or breed. The most common sites for this cancer to occur are the wrist, shoulder, knee and hip. Occasionally, it may invade bones of the skull, ribs or spine. The cause of osteosarcoma is unknown, but genetics may play a role.

Osteosarcoma begins in the bone but spreads through the blood stream very early in the course of the disease. The spread of cancer (known as metastasis) is thought to occur before even the first symptoms of the bone damage are detected. Only 5 to 10% of dogs with osteosarcoma will have visible lung metastases on a chest x-ray study when first diagnosed. For most other patients, metastases are present but too small to be seen at the time of diagnosis. This phase of the disease is called "micrometastasis." Over time, growth of metastases will ultimately lead to death. The lungs are the most common place for osteosarcoma to spread, but this cancer may also spread to other bones, skin and other organs.

Osteosarcoma is a very aggressive cancer in dogs. At this time, no cure is available. However, treatment may provide dogs with months to years of quality time.

DIAGNOSING OSTEOSARCOMA

The first sign of bone cancer is lameness due to pain from the cancer. As the cancer grows, a swelling at the tumor site may develop. In some dogs, the bone may break (fracture) at the cancer site.

X-ray studies (radiographs) are used as the first step in identifying bone cancer. Osteosarcoma destroys bone and creates visible changes supporting a diagnosis of cancer. Other diseases, such as infections, bone injuries, and other bone tumors, may mimic the appearance of osteosarcoma on radiographs. Radiographs of the lungs are also recommended to search for potential metastases.

A biopsy involves examining a sample of tissue under the microscope and is the only way to confirm the diagnosis of bone cancer. There are two methods of obtaining biopsy tissues.

Incisional biopsy: This is a relatively minor surgical procedure. An incision is made over the affected bone, and a small core or wedge of bone is collected. This procedure is done if the lesion is present in an unusual bone location for osteosarcoma, or if treatment decisions would be influenced by the diagnosis. Unfortunately, approximately 10 to 20% of biopsies completed this way may not be diagnostic because samples are inadvertently collected from the large volume of inflamed bone surrounding the diseased section. Other disadvantages of this procedure include the pain of the procedure and potential weakening of the diseased bone causing fracture. Results usually require 7-10 days.

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Surgical excision: Removal of the entire piece of abnormal bone is a more reliable test, because the whole region of bone can be evaluated. When destruction of the bone is so advanced that the entire bone must be removed regardless of the diagnosis, amputation also serves as the initial treatment for osteosarcoma. For patients who have supporting evidence including the location of the lesion, the radiographic appearance and general breed characteristics, amputation may be appropriate without a pre-operative biopsy.

A bone scan is another test recommended for some dogs. This test uses a radio-isotope to detect spread of the cancer to other bones. The patient is generally given a light sedative for relaxation, and a gamma camera scans the entire skeleton for other lesions.

TREATMENT AND PROGNOSIS

Treatment for osteosarcoma is designed to address both pain relief and metastasis. Options depend on the location and extent of the tumor. Remember: the goal of treatment is to allow your dog to enjoy a happy, functional, pain-free lifestyle.

TREATING BONE PAIN

Eliminating pain is the first priority for treating patients with osteosarcoma. Dogs may show evidence of pain by crying or whimpering and putting less weight on the involved leg. Other less-obvious signs of pain include repetitive licking, increased thirst, trembling, withdrawn or clinging behavior, restlessness and panting.

Amputation: Currently, this is the treatment of choice for most dogs with osteosarcoma. Amputation removes the primary source of the cancer and completely eliminates the pain. Dogs commonly function at a normal level after amputation, although concurrent arthritis and patient conformation may affect complete recovery. Most dogs are walking within 24 hours of the surgery, and three-legged dogs can enjoy the same activities as four-legged dogs.

Limb-sparing surgery: This surgery involves removing only the affected piece of bone and replacing it with a bone or synthetic support. This can be done only for tumors involving the distal radius location of the wrist and meeting certain requirements. Infection is the main complication of this surgery, and dogs require antibiotics for an extended period of time. Although this is a challenging procedure involving several weeks of rehabilitation, it is a good alternative for dogs with other orthopedic or neurological problems. This surgery is always followed with chemotherapy.

Palliative radiation therapy: A large burst of energy is directed into the tumor in one to five doses over a four-week period. The radiation energy decreases the pain associated with the tumor cells for several weeks to months, although it does not eliminate cancer from the bone. Approximately two of every three patients treated have relief from pain with this treatment.

Bisphosphonates: These medications prevent cells from weakening the bone. They are used most often to treat osteoporosis ("brittle bone disease"), and they reduce the pain of bone lesions in certain cancer patients. The bisphosphonate injection Pamidronate is used most commonly to treat dogs. Statistics regarding success of this treatment are currently being evaluated, and side effects appear to be rare.

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Samarium-153: Samarium-153 is a radio-isotope used to treat people with bone tumors. Given as an injection, it travels through the body to any bone altered by cancer cells. The material eventually leaves the body through the urine over a two-to-five day period, during which the patient is confined to the treatment facility. The effect may not be as complete as surgically removing the bone, but Samarium can simultaneously treat lesions in multiple bones. Side effects include a temporary but sometimes severe decrease in blood cell counts.

Pain medications: Medications can be administered as oral preparations, injections and slow-release patches to reduce inflammation and improve comfort for patients with bone cancer. However, patients no longer receive significant relief as the cancer cells continue to weaken the bone. If more aggressive therapy is not used, euthanasia is eventually the most humane way to eliminate the pain.

TREATING METASTASIS

Once the patient is made comfortable through therapy for the tumor site, the emphasis of treatment shifts to slowing or preventing osteosarcoma from developing in other areas of the body. Chemotherapy involves using medications to prevent cancer cells from dividing. Decreasing the progression of tiny cancer cell clusters (micrometastases) into bulky, debilitating secondary tumors generally improves life expectancy from a few months to one year or longer.

Several drugs are effective against osteosarcoma in dogs: Cisplatin, Carboplatin and Adriamycin. Outpatient injections are administered every two to three weeks while monitoring closely for any negative effects. Despite the negative experience of many humans patients treated with these medications, most dogs tolerate them with little to no temporary and manageable side effects. As individuals, each of our patients will have a slightly different response and outcome. Our goal is to maintain the best quality of life possible.

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