INFORMATION SHEET (ONCOLOGY)

Osteosarcoma

Osteosarcoma is a highly aggressive bone cancer characterised by painful local bone destruction and distant metastasis (spread to other organs). It is commonly seen in middle aged to older dogs, but can occasionally be seen in younger dogs less than two years of age. Any breed can develop an osteosarcoma but certain breeds are predisposed, in particular large and giant breeds. Osteosarcomas occur uncommonly in cats and non-bony (soft tissue) locations. 75% of osteosarcomas occur in the limbs, with the forelimbs affected twice as often as the hindlimbs. 25% occur in other parts of the skeleton (skull, ribs, vertebrae, pelvis). There has been some suggestion that bone cancers occur in large fast growing dogs or in association with metallic implants used to repair fractures, bone infections and in fractures in which no internal repair was used.

Clinical signs

Osteosarcoma of the limbs generally present with varying degrees of lameness, pain and/or a firm swelling which may become evident as the tumour size increases. There may be an initial improvement with rest and anti-inflammatory treatment. As the tumour progresses, further signs of discomfort may be seen including irritability, aggression, difficulty sleeping, decreased appetite and reluctance to exercise. In severe cases the animal may present with a fracture of the limb caused by weakening of the bone. Osteosarcoma in other parts of the skeleton present with swelling, pain and symptoms specific to the area affected. For example, with osteosarcoma of the jaw the animal may have difficulty eating which may be initially diagnosed as dental disease.

Diagnosis and staging

Initial diagnosis includes a complete physical examination, radiographs of the affected area and sometimes a biopsy. Treatment may be instigated without a biopsy if the animal's age, breed, location and radiographic appearance are very suggestive of osteosarcoma. However, in some cases we will also require a biopsy of the bone to confirm the cancer. Staging involves further tests to determine how many body organs the cancer has spread to (these are called "metastases"). These may include chest radiographs and occasionally a specialised bone scan (scintigraphy) to look for other area of bone involvement. We also perform screening blood tests and urinalysis to assess the general health of the animal and screen for concurrent medical problems that may influence treatment. Osteosarcomas metastasise early and approximately 90% will have metastasised at the time of diagnosis. These may not be detected on our initial staging tests because metastatic tumours are initially very small (microscopic) and must be at least 6-8mm in diameter to be seen. Therefore we need to manage osteosarcomas by treating the site they occur at and the whole body (to treat metastatic disease).

Treatment

The recommendations for treatment depend on many factors including the location of the tumour and any concurrent medical problems. In general the treatment associated with the best outcome (i.e. longest survival times) is surgery combined with chemotherapy. Surgery usually involves amputation of the affected area (limb, jaw), but in some select cases limb sparing procedures may be an option. When osteosarcoma occurs in areas of the skeleton other than the limbs (skull, vertebrae, pelvis) surgery can be more difficult and is sometimes not possible. In these cases other treatment modalities are considered. Surgery has two purposes: it removes the primary tumour which is necessary for cancer control; and it removes the source of pain which often dramatically improves quality of life. Amputation is almost always well tolerated by the patient and animals are able to adapt to life on three legs with very little difficulty. They have often not been bearing full weight on the affected leg for some time and will be much happier once the painful cancer is removed.

In animals where surgery is not possible, **radiation** therapy can be considered. Radiation is targeted at the primary tumour and can provide pain relief and palliation. Unfortunately access to radiation in Victoria is limited and this would require travel to Queensland. Radiation does not treat metastatic disease and must be combined with chemotherapy to treat disease elsewhere in the body. **Chemotherapy** is recommended in all patients with osteosarcoma because metastases are usually present at the time of diagnosis, even if we cannot detect them with our staging tests, and it has been shown to increase survival times (see prognosis). Chemotherapy is unlikely to cure patients with osteosarcoma but it can prolong a good quality survival time. The most commonly used chemotherapy drugs for osteosarcoma are carboplatin and doxorubicin and we typically use a combination of these. Chemotherapy is generally well tolerated in animals. Please see 'Chemotherapy in animals' handout.

Prognosis

Patients that have surgery and commence chemotherapy have an average survival time of 12–18 months and 20–25% of dogs may live longer than two years. If surgery (amputation) is the only treatment the average survival time is 4–5 months. Surgery alone will provide palliation and pain relief but does not extend survival times significantly. Radiation therapy has an average survival time of five months and when combined with chemotherapy has been estimated to give survival times of 6–9 months.

Bone cancers are known to be very painful. It is very important if the decision is made not to treat or to palliate a patient, that this pain is monitored and treated effectively. The average survival time with pain relief only is less than two months. If the cancer is affecting the limb signs of pain will often be seen as limping or reluctance to allow touching of the area. Some patients will be quiet and not want to eat. Behavioural changes, unusual vocalisation, fast heart rate, panting, salivation and dilated pupils may be interpreted as pain responses; however, each individual patient should be assessed by a veterinarian. Euthanasia must be considered if pain relief is not adequate and quality of life is poor.

Follow up

Following the completion of chemotherapy we recommend periodic rechecks to screen for recurrence or metastasis.