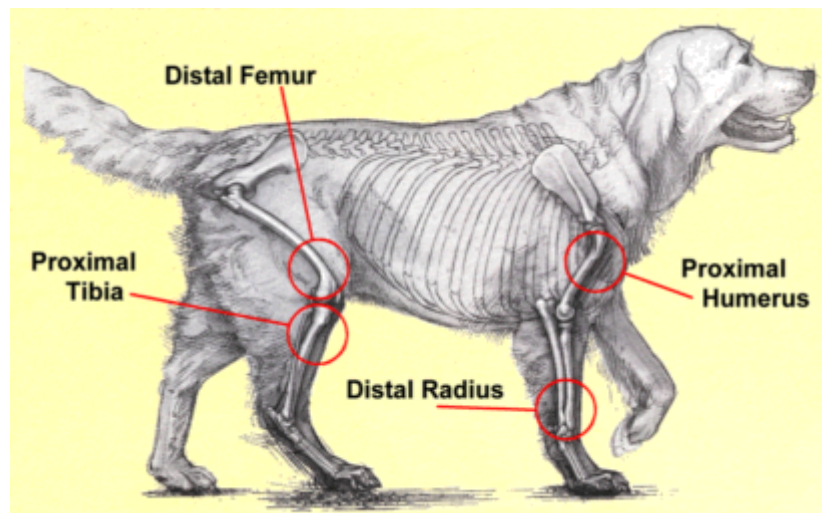


Osteosarcoma in dogs

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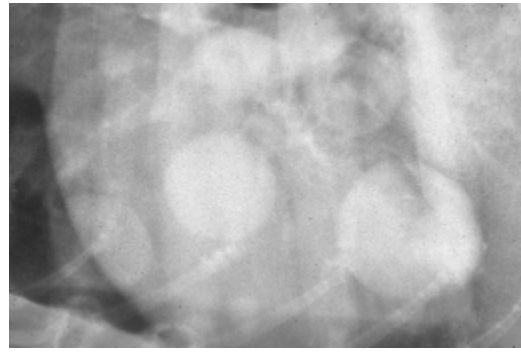
Osteosarcoma is the most common bone tumour in dogs. Large and giant dog breeds are most commonly affected in middle to old age. In $\frac{1}{4}$ of patients the tumour arises within the axial skeleton (skull, backbone, ribs, or pelvis) but in $\frac{3}{4}$ of patients a limb bone is affected. The most common limb sites are shown in the picture below.



Diagnosis

The usual presenting problem is progressive lameness associated with a swelling around the affected bone. Large breed dogs with these signs located at one of the classical limb sites should be taken to the vet as soon as possible.

Osteosarcoma cannot be diagnosed by a physical exam alone and the first test will usually be a radiograph or “x-ray”. Some other diseases can mimic osteosarcoma on a radiograph and so the vet may recommend a biopsy of the affected bone. This usually requires a general anaesthetic.



The vet should also obtain a series of chest radiographs to check for spread of the tumour to the lungs. Most dogs with osteosarcoma already have tumour spread to the lungs by the time they are taken to the vet but the secondaries are typically too small to show up on the radiograph. So why take the chest radiographs? The reason is that once secondary tumours are visible on radiographs chemotherapy is usually not helpful. Thus chemotherapy is usually only given to dogs whose chest xrays are clear.

Treatment

A treatment plan for a dog with an osteosarcoma should ideally address both the primary tumour in the affected bone and the secondary tumours in the lungs.

Primary tumour

Surgical options include amputation or limb-sparing surgery. This approach usually successfully removes the primary tumour but without chemotherapy to treat secondary tumours the average survival is only 4 months. For some sites, such as the backbone, surgery may not be an option

Amputation is the most widespread treatment for the primary tumour. Most owners are reluctant to pursue this option but many greyhounds manage very well on three legs. Before rejecting this option it is always worth asking to talk to other owners who own a canine amputee about their experience. Dogs that already have other bone

problems in another leg may not manage following amputation. Limb sparing surgery removes the tumour only leaving the rest of the limb. The resulting gap in the leg bones must be replaced and several options exist including using a bone taken from another dog that has died or metal implants. Limb-sparing is usually only used in patients with a tumour within the distal radial bone but surgeons continue to refine techniques. Limb-sparing surgery is a special skill and should only be attempted by a recognised specialist in orthopaedic surgery. Post-operative problems may include infection, breakage of the implant, and local recurrence of the tumour at the operation site and it may take some time before the dog is able to make full use of the limb.

Non-surgical options leave the primary tumour in place and try to manage pain. They include analgesic drugs, radiotherapy, and bisphosphonates. Osteosarcoma weakens the bone and one potential problem with non-surgical options is that when the dog feels more comfortable and bears weight fully on the limb the bone could break.

Thankfully these “pathological fractures” are uncommon.

Analgesics or “pain-killers” can help to manage lameness and discomfort for a short period. However most owners find their dog’s pain unacceptable within three months. Although radiotherapy can be used to destroy tumours, in osteosarcoma it is used to provide pain relief. UK veterinary radiotherapy facilities are currently limited but are likely to increase over the next 5 years. Most dogs have reduced pain following radiotherapy but the effects of radiotherapy are delayed taking an average of 3 weeks to become manifest. The average duration of benefit is 2-3 months. Bisphosphonates are a class of drugs that reduce bone destruction and pain. Thus two potential beneficial effects for dogs with osteosarcoma are pain relief and a reduced risk of pathological fracture. Over the last 2 years Cave Referrals has been using one of the most powerful bisphosphonates, zoledronate, to treat dogs with osteosarcoma where

surgery is not possible or the owner does not wish to pursue it. Approximately 60% of patients have experienced substantial pain relief within a few days of treatment. This benefit has lasted an average of 5 months but some patients have remained comfortable for up to 10 months. Despite long periods living with a tumour none of the dogs have developed a pathological fracture. Not all bisphosphonates are as effective. Although zoledronate is expensive, dogs that enter our study receive it at a 25% discount on the manufacturer's price.

Secondary tumours

Chemotherapy is used to treat secondary tumours. In most dogs treatment is not curative but it substantially increases average survival times following removal of the primary tumour to between 9 and 15 months. The proportion of dogs alive 1 year after surgery increases from 1 in 10 with surgery alone to 5 in 10.

Most clients who have never owned a dog that has received chemotherapy believe that it will make the dog unwell and so are reluctant to pursue this option. However most owners whose dogs have undergone chemotherapy with a veterinary oncologist are surprised at how uncommon side effects can be. This is because most vets believe that quality of life is more important than quantity. As a result we use chemotherapy cautiously and adapt treatment to the individual dog when problems do occur.

Carboplatin is one of the most widely used drugs for osteosarcoma. In my experience, dogs receiving carboplatin do not lose their hair and rarely vomit or have diarrhoea.



Cave Referrals is based just south of Bristol. Tom Cave sees dogs and cats with medical problems ranging from diabetes to heart disease in addition to his oncology

cases. Surgical patients are treated by a European specialist in small animal surgery.

Claire Cave has worked as an intensive care nurse at both Bristol and Glasgow

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