

Osteosarcoma

What is osteosarcoma?

Osteosarcoma is a type of cancer of the bone. It can affect any dog, but large-breed, middle-aged dogs are most commonly affected. It can occur in any bone, but the most frequently affected sites are the ends of the long bones –the end of the radius towards the carpal joint (equivalent to our wrist) or around the knee. The first sign of this type of cancer is generally lameness due to pain, which can be severe. Rarely the weakened bone will fracture (break). As the cancer develops a lump may be seen or felt at the site. Osteosarcoma can also develop at less common sites such as the jaw, spine or a rib.

How is it diagnosed?

X-rays may arouse a suspicion of osteosarcoma, but a specific diagnosis requires evaluation of a biopsy by a pathologist. This can be performed either via fine needle aspiration under ultrasound guidance or with larger needles through small skin incisions. At the same time patients are evaluated for secondary spread of the tumour –ideally with a chest and abdomen computed tomography (CT scan). Blood tests usually don't help in diagnosis but some blood parameters might carry a prognostic value.

What treatment is possible?

Osteosarcoma is an aggressive type of cancer. The secondary tumours (mainly in the lungs) are usually microscopic and therefore may not be seen on scans/x-rays but usually are present at the time of diagnosis. Since osteosarcoma is a very painful condition, the main treatment objective is to alleviate discomfort. Given the high potential to spread, additional treatment is recommended following local treatment. Treatment options include:

1. **Amputation:** since this removes the tumour, it also removes the source of pain. However, the secondary tumours will continue to progress and so average survival with surgery alone is around 4 months. Owners are often worried that their dog will not cope well on three legs but as long as the other three legs are healthy, even large dogs can cope very well. Due to existing cancer of the affected limb, most dogs are already only using 3 legs at the time of diagnosis. Amputation of a hindlimb is tolerated slightly better than amputation of a forelimb.
2. **Bisphosphonates:** In some dogs, drugs called bisphosphonates, which aim to slow down bone lysis can help reduce the pain of osteosarcoma without amputation. However, this is only a temporary measure. Bisphosphonates are typically given intravenously every 3-4 weeks, or via tablets at home.
3. **Limb-sparing surgery:** This involves a localised resection of the tumour and then stabilisation of the affected bone by placing a large spacer at the tumour site, secured with a large bone plate. It is usually only an option for osteosarcoma of the lower part of the forelimb (distal radius/ulna). The risk of complications, mainly post-operative infection is relatively high and so limb-sparing should be carefully

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The Granary, Bunstead Barns, Poles Lane,
Hursley, Winchester, Hampshire SO21 2LL

Tel: 01962 767920 Fax: 01962 775909
Email: info@andersonmoores.com
www.andersonmoores.com

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VAT Registration No. 881327808

considered and performed by specialist orthopaedic surgeon. It can be useful for some dogs with orthopaedic disease in the other limbs or in very large dogs. Limb-sparing surgery is usually performed in conjunction with chemotherapy.

4. **Chemotherapy:** For dogs with osteosarcoma chemotherapy is performed in conjunction with either amputation or limb-sparing surgery. It usually involves 6-8 doses of intravenous medication, given every three weeks. Chemotherapy can extend the average survival time to around 12 months, meaning 50% of dogs are alive at 12 months. Once spread of the cancer occurs, chemotherapy is usually unrewarding. Please see our separate brochure on chemotherapy for more details.
5. **Radiation:** Radiation can be very helpful in controlling pain associated with osteosarcoma. The majority of dogs experience pain relief within few days, which can last up to 6 months but the radiation does not affect the development of the secondary tumours. Additionally, there is an increased risk of fracture at the tumour site, once the dog feels less painful. We currently don't offer radiation therapy but we closely cooperate with other facilities in the UK.
6. **Euthanasia:** The pain associated with osteosarcoma is usually severe and so doing nothing is usually not an option on humane grounds. If an owner does not wish to pursue the treatment options listed above than saying a final farewell to their pet is generally the kindest option.

This example of an X-ray of the right radius of a dog shows an aggressive bone lesion causing bone destruction along with proliferative changes and soft tissue swelling, which might look like a painful lump at the level of wrist.



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