

Specialist Referral Service
Willows Information Sheets

Osteosarcoma





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are more likely to
develop Osteosarcoma*

Osteosarcoma

What is osteosarcoma?

Osteosarcoma is a cancer that originates in bone tissue. In dogs the most commonly affected bones are the humerus (upper arm), radius/ulna (forearm), femur (thigh) and tibia (shin). Other bones, such as those of the skull, spine, scapula (shoulder blade) and pelvis, are less frequently affected. Large and giant breeds are much more likely to develop an osteosarcoma than medium and small breeds. In dogs, osteosarcoma affecting the long bones tends to be highly malignant with spread (metastasis) of cancer cells to other parts of the body especially the lungs. This has typically occurred at a microscopic level in most dogs by the time the tumour is diagnosed.

What are the signs of osteosarcoma?

Osteosarcoma affecting the humerus, radius/ulna, femur or tibia will typically cause severe bone pain and associated fore or hind limb lameness. The lameness tends to be progressive, relentless and responds poorly to conventional pain killing drugs. As the tumour grows it may result in a visible or palpable swelling of the affected bone. Muscle wastage (atrophy) is often a marked feature. In advanced cases the cancer may weaken the bone to such an extent that it fractures.

How is osteosarcoma diagnosed?

Radiography (X-ray) is the most common method of diagnosing osteosarcoma. Evidence of bone destruction is a common feature, and when detected it is highly suggestive of osteosarcoma, especially since other bone tumours and other conditions that cause bone destruction, such as bone cysts and bone infections, are much less common. Advanced imaging techniques, for example a CT scan, may provide additional information, including the extent of bone involvement. Radiographs or a CT scan of the chest and an ultrasound scan of the abdomen should be considered in dogs with suspected osteosarcoma to look for evidence of metastases (tumour spread). A definitive diagnosis of osteosarcoma requires a sample of tissue being obtained (a biopsy) and examined microscopically. Blood tests may also be performed to assess the patient's general health and fitness for treatment.



X-rays showing both destruction of bone and irregular new bone formation in a Great Dane with an osteosarcoma affecting the end of the radius (bone in the forearm)

What are the treatment options for osteosarcoma?

The two main treatment options for osteosarcoma affecting the long bones in dogs are surgery and chemotherapy. Radiotherapy and drugs that influence bone activity (metabolism) are occasionally recommended. Analgesics (pain killers) should be administered as necessary.

Amputation of the affected limb provides rapid pain relief and is a good option in those dogs that have no significant problems with their other three limbs. Even giant breed dogs rapidly adapt to losing a limb, and client satisfaction about their dog's wellbeing is generally high following this type of surgery. The possibility of local recurrence of tumour is minimal with this approach, although, spread to other parts of the body is very common, with the result that the chance of the dog surviving six months following amputation without subsequent chemotherapy is less than 50%.

Surgical alternatives to amputation include techniques which remove the tumour but maintain the limb (referred to as 'limb sparing'). The cancerous section of bone is removed, and metal plates and screws are used to bridge the gap which is filled with a graft or prosthesis. Fusion (arthrodesis) of the adjacent joint is usually required, because osteosarcomas tend to involve the extreme ends of bones near joints. Limb function following removal of a tumour affecting the end of the radius accompanied by fusion of the carpal joint (wrist) is generally very good, with average survival times similar to those following amputation.



X-rays obtained after surgery in a Newfoundland with an osteosarcoma affecting the radius. The tumour has been excised (cut out) and the gap in the bone bridged with two plates that are attached to the remaining bones with multiple screws. The carpus (wrist joint) has been fused.

In view of the high likelihood of osteosarcoma tumour cells having seeded to other parts of the body, chemotherapy is almost always

recommended after either amputation or limb sparing surgery. This involves administering one or more anti-cancer drugs which aim to increase survival, but at the same time minimise side effects and maintain a good quality of life. In general, chemotherapy when combined with surgery results in a two-fold increase in survival time compared to surgery alone, although there appears to be a smaller number of dogs that achieve much longer survival times than this.

When osteosarcoma affects the mandible (lower jaw bone), maxilla (upper jaw bone), skull or nasal cavity (nose) the treatment typically comprises surgery, with or without radiation therapy. Osteosarcoma affecting these sites may have a better long-term outcome, but this varies widely depending on the site and size of the tumour.

For more information, please see our information sheets on [Limb Sparing Procedures](#) and [Arthrodesis](#).

If you have any queries or concerns, please do not hesitate to [contact us](#).

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