

## INTRODUCTION

Osteosarcoma is the most common primary bone tumor in dogs.

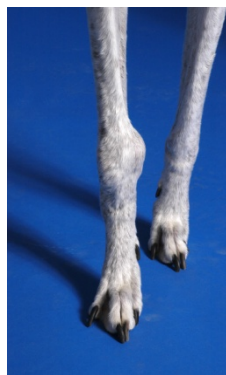
- The most common sites are the long bones of the body, including the proximal humerus, distal radius, distal femur and proximal tibia.
- Osteosarcoma can also occur in the flat bones such as the skull, spine and pelvis, but this is much less common.
- Though osteosarcoma can happen to a dog of any age, it usually affects large breed dogs that are middle-aged to older.
- The more common breeds affected are Saint Bernard's, Great Danes, Irish Setters, Dobermans, German Shepherds, Golden Retrievers, Irish Wolfhounds, and Rottweilers.

Although most dogs present for evaluation of the primary bone tumor, this disease is highly metastatic, and spreads to other parts of the body quickly (most commonly the lungs). **Ninety (90%) percent of dogs have had microscopic spread of this disease at the time that their primary tumor is diagnosed.**

## CLINICAL SIGNS

Osteosarcoma is a very aggressive disease.

- The tumor grows within the bone causing pain, swelling, and can result in weakening of the affected bone.



- As the tumor grows, the affected area will continue to swell. Owners will usually notice limping or lameness in the affected leg. In some cases, acute signs of non-weight bearing lameness can occur after the weakened bone fractures. This is referred to as a pathologic fracture.



- In more chronic cases, lameness can be initially intermittent over days to months, but will eventually become more constant.

## DIAGNOSIS/STAGING

Once osteosarcoma is suspected, there are several diagnostics that can be conducted.

- Radiographs of the affected limb can strongly support a diagnosis.
- Bone biopsies are generally needed to obtain a definitive diagnosis, but, if the radiographs are strongly suspicious in an older large breed dog, a biopsy is often not needed. Diagnosis can also be confirmed at time of treatment of the primary tumor.
- Chest radiographs are obtained to look for evidence of metastasis to the lungs.
- Bloodwork consisting of a CBC to assess the red and white blood cells and platelets, a chemistry panel to look at organ function (particular the ALP- alkaline phosphatase, a prognostic indicator), and a urinalysis are recommended.

## TREATMENT

Treatment options vary; however, the most effective treatment combines treatment modalities to treat both the primary tumor and to address the inevitable risk of disease spread.



### 1. **Surgery**: *The most common treatment is surgical amputation of the affected limb.*

- Most pets, even the largest of breeds, do very well following an amputation and are up and walking 24-36 hours after surgery.
- Radiographs of the other limbs should be taken prior to amputation to determine if your pet will be able to ambulate well on 3 limbs.
- An alternative to amputation is a surgery called limb-spare and is available only if the tumor is in a specific location (distal aspect of the front limb). In this procedure, the affected bone is removed and replaced with a donor bone. This is a complicated surgery and is only performed at select veterinary surgery centers. Complications include infection, implantation rejection, fracture, and the possibility of tumor recurrence at the site.
- Another surgical treatment is stereotactic radiosurgery. In this type of treatment, high doses of radiation are delivered intra-operatively with the hopes of destroying the cancerous portion of the limb. The benefit of this

surgery is that no significant functional impairment of the limb is anticipated and recovery long-term is excellent. This procedure is currently only available at the University of Florida.

- Surgery alone has a median survival time of 4-6 months, with most dogs succumbing to disease due to pulmonary metastasis.

### 2. **Chemotherapy** *is recommended in conjunction with surgery.*

- The chemotherapy drugs, carboplatin and doxorubicin, are the most common drugs used to treat this disease.
- When combined with surgery, chemotherapy results in an anticipated survival time of approximately 12 months in 60% of patients. About 25% of the dogs can be cured.

### 3. **Radiation therapy** *is used for pain control and does not have long lasting effects.*

- Several doses may be given over time and does not alter the risk of disease spread, fracture, or local disease progression.

### 4. **Bisphosphonates** *can also be used if the owner does not elect to amputate the leg.*

- These drugs are believed to help decrease how fast the bone is broken down. Accordingly this medication is primarily used to reduce bone pain. It is an intravenous infusion given once every 3-4 weeks and does not alter the risk of disease spread, fracture, or local disease progression.

## 5. Pain medications

- In addition to the treatments discussed above, the use of NSAIDS (non-steroidal anti-inflammatory) and other pain relievers, such as Tramadol, gabapentin, and fentanyl (opioid) patches, can be used to help with pain.

**Unfortunately, most dogs that do not undergo an amputation are euthanized because we are unable to control their pain.**

## CONCLUSION

Osteosarcoma is an aggressive disease characterized by primary tumor pain and a high risk for spread to the lungs. The decision to pursue treatment is dependent on several factors that you must accept. The first is the cost. The second is the risk associated with treatment. And the third is the goal for your pet based on the prognosis with the chosen treatment. With your acceptance of these factors, we will do our best to give you and your pet the best quality time together while providing the highest quality of veterinary care.

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