

## Bone Cancer (Osteosarcoma)

### What is Primary Bone Cancer?

Bone cancer can mean any cancer in bone whether it originated there or spread from a different location. The primary type of bone cancer seen in dogs and cats is osteosarcoma (OSA). It is a painful and highly metastatic (spreads to other parts of the body) form of cancer. As an OSA grows, it destroys bone causing inflammation and swelling around the affected bone resulting in pain and lameness on the affected limb. These tumors are rarely detected in early stages because most are initially thought to be an orthopedic injury causing lameness. Osteosarcomas are also highly metastatic where many dogs will develop lung metastases within months following diagnosis.

### Diagnosis

Bone cancer is suspected when lameness and focal bone pain are found during physical exam. A diagnosis is all but confirmed when x-rays reveal the typical mixed bone destruction and proliferation. Once bone cancer is suspected, a biopsy is usually next performed to confirm the presumptive diagnosis. The biopsy should be performed so that it does not negatively impact a future surgical procedure to remove the tumor. All biopsy tracts and previous incisions must be removed as part of the tumor removal in order to prevent tumor cells being left behind.

### Common X-ray Appearance of Bone Cancer Lesion



= lower  
front  
leg

= wrist

= front  
foot

## **Treatment Options**

### **Forelimb / Hind Limb Amputation**

Amputation of the affected limb has been the standard procedure for primary bone cancer for many years. In a majority of cases, it is the only method of achieving complete removal of the tumor. Forelimb amputation is best performed at the level of the scapula. Hind limb amputation is performed at or just below the hip joint or by removing part of the pelvis if the tumor is located very close to the hip. Systemic administration of opioid analgesics, regional nerve blocks and epidural analgesia are all methods of providing for a smooth and comfortable recovery. Postoperative pain management is provided by use of narcotic and anti-inflammatory medications for the few weeks post-op. Most dogs do very well after amputation and many are immediately improved because the bone pain has been completely eliminated. Additionally, many have endured very poor limb function prior to surgery and the burden of carrying the affected limb is gone post-operatively. It takes approximately 4 weeks or so for patients to develop full strength in the remaining limbs allowing for a complete return to normal activity.

### **Scapulectomy**

Tumors that involve the scapula (shoulder blade) are uncommon, but have traditionally been treated by amputation. Partial or complete scapulectomy with preservation of the forelimb has been described as a successful alternative. If the tumor is located in the upper part of the scapula, away from the shoulder joint, partial scapulectomy can be performed. The supportive structures of the shoulder joint remain intact and limb function is near normal in many cases. Complete scapulectomy is indicated when the lower part of the scapula is involved. In this procedure the entire scapula is removed. Postoperatively the limb is maintained in a sling for two weeks prior to the patient being allowed to use the limb. This procedure has been performed successfully in small dogs and cats and in dogs as heavy as 35 kilograms. Large and giant breed dogs will have a more pronounced limp, but can still use the limb for support.

### **Hemipelvectomy**

Tumors that occur within a pelvic bone can sometimes be treated surgically by removal of the affected bone. The actual portion of the hemi-pelvis (meaning ½ of the pelvis) to be removed is determined by tumor location. An entire hemi-pelvis can be removed, but the tumor must not cross midline. The surgery almost always involves amputation of a rear limb due to the tumor being close to the hip joint. Some tumors can extend within the pelvic canal and in order to determine their full extent, MRI or CT scan can be used for surgical planning. Recovery is typically very similar to that of a hind limb amputation patient.

There are a number of other palliative options available as well that would be discussed in detail during exam.