

Got Good Bone?

By: Catherine Emanuel

Part of owning a large breed is coming to terms with diseases that are common their structure, type and genetics. Although the Anatolian Shepherd Dog (ASD) is generally considered healthy and free of disease, there are diseases that are more prevalent than others; this is caused by a combination of the environment and genetics. The distribution of the causes varies with the ailment. When we consider these diseases and their lack of prevalence amongst the working dogs of Turkey, it should be considered that the lifespan of the working dogs in Turkey is significantly reduced from that of the dogs in the United States.

One of the more common ailments in large breeds dogs that has been reported in the ASD is osteosarcoma (by definition: sarcoma (a form of cancer) of the bone). Osteosarcoma is on of the more common bone tumors in dogs, especially those with greater bone density (placing the ASD at risk), affecting 8,000-10,000 animals/year¹. The onset of the disease is usually noted in middle aged or elderly dogs (which is uncommon of the dogs in Turkey). Although the disease can manifest in any bone, 75-85%² of the reported cases affect the limbs. This form of the disease is called appendicular osteosarcoma.

The disease develops deep within the bone. Pain progresses as the bone is destroyed from the inside out. As the tumor grows the swelling becomes noticeable upon visible inspection. Eventually, the bone is replaced with tumorous bone, causing weakness in the bone. Quite often this results in a fracture caused by what would be normally considered a minor injury. These fractures are caused by the diseased bone and sadly never heal and quite often cause permanent discomfort.



Figure 1: View of Osteosarcoma (tumor) in Canine³

This disease is usually identified following persistent lameness through radiography (x-rays). Osteosarcoma is usually indicated after these characteristic findings are identified: the presence of a lytic lesion (a portion of the bone looks eaten away); the presence of the sunburst pattern (a corona effect is indicated by the outward tumor growth which pushes the normal bone away from the area); a pathological fracture; and/or the affected area does not cross the joints. It is important to note that this disease can be mistaken for several other common cancers, i.e., chondrosarcoma, squamous cell carcinoma and synovial cell carcinoma. Although the treatment of these other cancers is often similar, the route cause is often different and the genetic component of the disease differs with each disease. Coccidioidomycosis, a fungal infection of the bone, also manifests in a similar manner to osteosarcoma; however, the treatment and prognosis is significantly different.

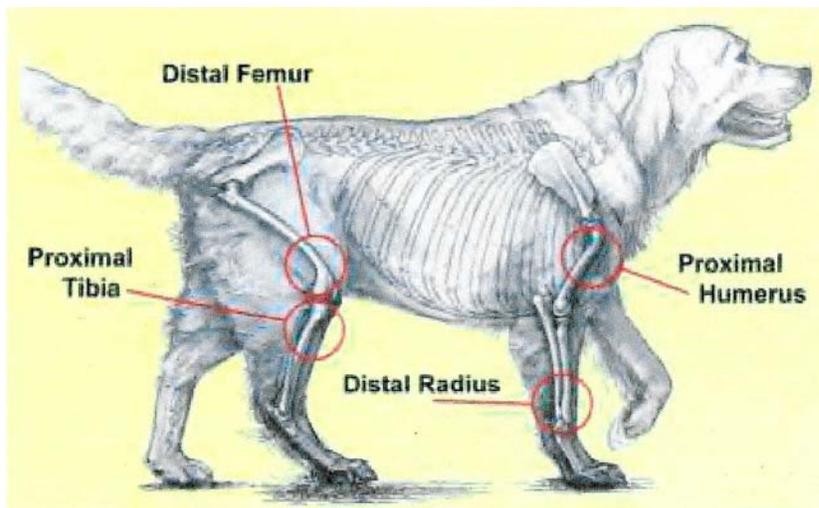


Figure 2: Usual Sites For Osteosarcoma Development⁴

Osteosarcoma can be treated with chemotherapy, radiation and surgery; however, the long-term prognosis is not favorable, especially since it occurs frequently in older dogs that are unable to sustain the treatments.

What does this mean? How did my dog get this and can I breed? The good news is that just because ASDs may be more prone to this disease than beagles, it does not mean that they all carry the gene for the disease. The etiology of osteosarcoma is varied, with the greatest percentage occurring spontaneously. Following spontaneous tumors, genetic determined susceptibility remains the greatest concern, with large breeds being 60 times more likely to be affected by the disease (90% of osteosarcoma occurs in dogs greater than 35 lbs.). Increased trauma due to size and weight (especially during periods of growth), abnormal cell metabolism caused by rapid bone growth, and the inheritance of genes are all factors to be considered when evaluating the etiology of the illness.⁵ Other causes include: radiation, fracture and bone infarcts .



Figure 3: Osteosarcoma Formation in Anatolian Shepherd Dog

The prognosis is changing...Currently the National Cancer Institute is working on a long-term project with dogs with osteosarcoma. Dogs that are proven by biopsy to have osteosarcoma will be eligible for inclusion in a new chemotherapy treatment protocol. In the meantime the best way to stay on top of this ever growing disease is communication. This will allow us to track the prevalence of the disease within the breed beyond the antidotal stories told at ringside.

¹ Unpublished research from Louisiana State University, Department of Oncology, 2004.

² Unpublished report by Mar Vista Animal Medical Center, 2004.

³ Kuntz In: Malawer (2001) Musculoskeletal Cancer Surgery, Appendix B: Canine Osteosarcoma.

⁴ www.marvistavet.com/html/body_canine_osteosarcoma.html

⁵ Maulin et al. (1998) Canine osteosarcoma. J Vet Intern Med.