

## Neoplasia of Bone

Cancer	Clin. Signs	Rad. or Gross Appearance	Pattern of Met.	Tumor Location	Diagnosis, Prognosis, TX
<p>Osteosarcoma (85-90% of bone tumors)</p> <p>*Malignant mesenchymal neoplasm in which the tumor cells produce osteoid</p>	<p>Acute lameness w/wo firm swelling</p> <p>Lameness without hx of trauma in large breed dogs</p> <p>Large and medium sized dogs commonly affected</p> <p>Bimodal age distribution 2yrs and 7.5yrs</p>	<p>Arise from the endosteum of the metaphysis</p> <p>“Aggressive” lesions with bone lysis and compensatory bone production</p> <p>*typically do not cross joint spaces</p> <p>** may arise spontaneously at the site of bone infarctions, previous fxs, and metallic implant sites</p>	<p>Strong pulmonary trophism and usually metastasizes</p> <p>By the time of diagnosis there is a 90% chance that the tumor has already metastasized to the lungs but it may be microscopic and undetectable via radiographs.</p>	<p>Away from the elbow and towards the knee + distal tibia</p> <p>(Proximal humerus, distal radius, distal femur, proximal tibia)</p> <p>-Appendicular skeleton (75%) -axial skeleton (24%)</p>	<p>Histopathological diagnosis w/ core biopsies is the gold standard</p> <p>Need to demonstrate histological presence of tumor associated osteoid</p> <p>*UCD Fresh biopsy tissue is stained with active alkaline phosphatase (AP), positive expression is strongly associated with OSA</p> <p>Subtype may dictate prognosis but most OSA tumors are a mix of subtypes</p> <p>Telangiectatic worse than fibroblastic</p> <p>Curative/palliative therapy: Amputation and chemo</p>

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<p>Chondrosarcoma (10% of bone tumors)</p> <p>Malignant mesenchymal neoplasm producing cartilage (no tumor-associated osteoid)</p>	<p>Occur most commonly in medium to large breed, older dogs</p>	<p>Large, multilobulated tumors +/- a blue-white gelatinous appearance</p>	<p>Tends to metastasize to the lungs as opposed to regional lymph nodes</p>	<p>Tends to occur in flat bones (ribs, nasal cavity, mandible, pelvis) and are thought to arise from medullary cavity NOT articular cartilage</p> <p>*also found in the ribs and sternum of sheep</p>	<p>Longer disease course than OSA</p>
<p>Fibrosarcoma and Hemangiosarcoma of the Skeleton (5% of bone tumors)</p>	<p>Golden retrievers, Doberman Pinschers, German Shepherds</p>	<p>FSA- Grey-white HSA- gelatinous and bright red</p>		<p>Tend to start in the medullary cavity or periosteum</p> <p>“biologically high grade/histologically low grade FSA” arise from the periosteum of the maxillary bone leading to “potato-nose”</p>	<p>HAS or the skeleton may have a worse prognosis than OSA</p>
<p>Multilobular sarcoma of bone  (multilobular tumor of bone, multilobular osteoma, chondroma rodens, multilobular osteochondrosarcoma)</p>	<p>Dogs and rarely cats</p>	<p>Firmly attached to the skull and can severely compress the brain</p>	<p>Slow growing and locally destructive</p> <p>Tend to recur after local resection</p>	<p>Arise from flat bones of the skull and mandible</p>	

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<p>Round Cell Sarcoma</p> <p>Lymphoma (lymphosarcoma)</p>	<p>Common in all domestic species</p>	<p>Derived from lymphocytes</p>	<p>Can occur as a primary bone marrow tumor or spread to the medullary space of the bone via metastasis from a distant site or local extension.</p>	<p>Bone marrow</p>	
<p>Round Cell Sarcoma</p> <p>Multiple Myeloma</p>	<p>Dogs</p>	<p>Tumor of well-differentiated plasma cells that infiltrate and replace the marrow elements of multiple bones</p>		<p>Lumbar vertebrae</p>	<p>Radiographs Serum electrophoresis (monoclonal gammopathy) Urinalysis Biopsy w/ IHC stain</p> <p>Tx: Chemo</p>
<p>Round Cell Sarcoma</p> <p>Histiocytic sarcoma</p>	<p>Dogs</p>	<p>Pleomorphic cells with abundant cytoplasm.</p> <p>Neoplastic cell population may produce large multinucleate giant cells and some cell may exhibit phagocytosis</p>	<p>Can arise de novo from the medullary space or</p>		

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<p>Carcinomas (metastatic/local extension)</p>	<p>less common in vet. species than humans but can occur in dogs and horses</p>	<p>Transitional cell carcinoma            Anal Sac Adenocarcinoma            Prostatic adenocarcinoma            Carcinomas of the lung, mammary, and thyroid glands</p> <p>In horses squamous cell carcinoma (sheath/penis) often metastasize to the sublumbar lymph nodes and extend into the lumbar spine</p>			
<p>Chordoma</p>	<p>Ferrets</p>	<p>Arise from the nucleus pulposus (notochordal cell)            Reminiscent of cartilage tumors or myxosarcomas with abundant blue-staining proteoglycan</p>		<p>Typically occur within the tail</p>	
<p>Giant cell tumor of bone (osteoclastoma)</p>	<p>Dogs, cats, horses, and goats</p>	<p>Multinucleate giant cells that are thought to be osteoclasts with a background of neoplastic spindle cells</p>			

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Osteoma	Horses, dogs and cats	<p>Dense, smoothly contoured, protruding, slowly progressive tumor of well-differentiated bone. Dense and hard!</p> <p>Woven bone will be seen histologically which is why a good history and documentation of radiographic changes is key!</p>	Benign but can destroy adjacent tissue via compression atrophy and compromise jaw/joint function or breathing	<p>Periosteum of the skull and mandible, occasionally the pelvis</p> <p>(anatomic regions characterized by intramembranous bone formation)</p>	
Ossifying Fibroma	Young horses, occasionally dogs or cattle	Fibro-osseous lesions / "fibroma with bone in it"		<p>Large, firm mass that distorts the maxilla and mandible</p> <p>Can occur in the nasal turbinates and sinuses along with the rostral mandible in horses (equine juvenile mandibular ossifying fibroma)</p>	Benign but may compress, distort, and cause atrophy of adjacent normal tissues