OSTEOSARCOMA
(BONE CANCER)

BASICS

OVERVIEW
- Most common primary bone tumor in dogs
- "Appendicular" is an adjective relating to the limbs; "axial" is an adjective relating to the head and trunk of the body
- Osteosarcoma typically affects the appendicular skeleton of large- to giant-breed dogs
- Cancerous (malignant) tumor, with spread to the lungs (known as "lung metastases") in more than 90% of dogs at the time of diagnosis; lung metastases may be microscopic
- Cats—less common; less aggressive biologic behavior than in dogs

GENETICS
- Does not appear to be inherited; although breed susceptibilities do occur
- Breed size and rate of maturity may be more important than breed or family line

SIGNALMENT/DESCRIPTION of ANIMAL

Species
- Dogs and cats

Breed Predilections
- Dogs—large- to giant-breed dogs
- Cats—domestic shorthair

Mean Age and Range
- Dogs—bimodal peak at 2 years and 7 years; reported as young as 6 months of age
- Cats—mean age, 8.5 years; range, 4 to 18 years of age

Predominant Sex
- Dogs—males predominate (1.2:1) in most reports

SIGNS/OBSERVED CHANGES in the ANIMAL
- Depend on site
- Signs may be subtle
- Swelling, lameness, and pain common
- Other complaints—lack of appetite (inappetence) and sluggishness (lethargy)
- A firm, painful swelling of the affected site common
- Degree of lameness—varies from mild to non–weight bearing
- Fractures occurring at the site of weakened bone (known as "pathologic fractures") are rare

CAUSES
- Unknown

RISK FACTORS
- Dogs—large- to giant-breed dogs; metallic implants at fracture-repair sites; history of exposure to ionizing radiation
- Dogs—early spay/neuter suggested as a cause in rottweilers
- Cats—unknown

TREATMENT

HEALTH CARE
- Diagnostic evaluation—outpatient
- Surgery and the first chemotherapy treatment—inpatient
- Subsequent chemotherapy—outpatient
- Manage pain, as needed
- Radiation therapy will decrease pain effectively in dogs and cats

ACTIVITY
- Restricted after surgery, until adequate healing has occurred

SURGERY
Appendicular Sites (relating to the limbs)
- Amputation of affected limb—limb amputated at the forequarter (including the scapula and shoulder joint) or hip

• Limb-sparing or salvage therapy—used for osteosarcoma of the distal radius (bone in the lower front leg); available at a limited number of referral hospitals
• Chemotherapy—recommended after either surgical procedure

Axial Sites (relating to the head and trunk of the body)

• Aggressive surgical removal (excision) of the tumor
• Chemotherapy—recommended after surgery

Soft-Tissue Sites (tissues other than bone)

• Aggressive surgical removal (resection) of the tumor
• Chemotherapy recommended after surgery

Metastasectomy (surgical removal of metastasis)

• Surgical removal of metastasis to the lungs (known as "pulmonary metastasectomy")—has been described; indicated in animals that: 1) had a long disease-free interval after diagnosis; 2) have less than 3 detectable lung nodules; 3) have a lesion doubling time greater than 30 days

Cats

Appendicular Sites (relating to the limbs)

• Amputation of affected limb
• Chemotherapy may not be necessary

Axial Sites (relating to the head and trunk of the body)

• Attempt aggressive surgical excision—depending on site of lesion
• Local recurrence—main reason for treatment failure

Both Species

• Inoperable cancer—radiation therapy offers marked pain relief

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

• Postsurgical chemotherapy with a platinum-based protocol—current standard of care; chemotherapeutic drugs include cisplatin, carboplatin (use in cats), and doxorubicin
• Palliative medication is intended to improve the animal's condition and quality of life, it is not a cure for the cancer; these drugs are used to control pain and/or decrease inflammation; options include: aspirin, piroxicam, or other nonsteroidal anti-inflammatory drugs (NSAIDs); acetaminophen with or without codeine, tramadol or a fentanyl patch—not all of these drugs can be used in combination; consult your pet's veterinarian for the most appropriate pain management for your pet

FOLLOW-UP CARE

PATIENT MONITORING

• Monitor for reduction of bone-marrow activity (known as "myelosuppression"), resulting in low number of red-blood cells, white-blood cells, and/or platelets; should have a complete blood count (CBC) performed 7 to 10 days after chemotherapy
• Take chest X-rays every 2 to 3 months after surgery
• Take X-rays of graft site for cases with limb-sparing or salvage therapy every 2 to 3 months after surgery, because local recurrence is possible after limb salvage

POSSIBLE COMPLICATIONS

• Spread of cancer (metastasis) to lungs, bone, and soft-tissue sites
• Hypertrophic osteopathy (a bone disorder that causes painful swelling of bone and lameness) with spread of cancer to lungs (lung metastases)

EXPECTED COURSE AND PROGNOSIS

• Long-term prognosis is poor; achievable goals should be to relieve discomfort and prolong a good quality of life

Dogs

• Median survival without treatment, with amputation alone, or with palliative radiation therapy alone—approximately 4 months
• Median survival with surgery and chemotherapy—10 months
• Osteosarcoma of the lower jaw (known as "mandibular osteosarcoma")—less aggressive than other sites; 1-year survival with surgery alone—71% reported

Cats

• Appendicular (involving the limbs)—median survival with surgery: greater than 2 years
• Axial (involving the head and trunk of the body)—median survival with surgery: 5.5 months

KEY POINTS

- The most common primary bone tumor in dogs
- This disease has an aggressive biologic behavior; therapy should be directed at the painful bone tumor (using either surgery or radiation therapy) as well as at metastatic disease (using chemotherapy)
- Long-term prognosis is poor; achievable goals should be to relieve discomfort and prolong a good quality of life