Lake Shore Pet Hospital

Multiple Myeloma

Basics

OVERVIEW

- Plasma cells are specialized white blood cells; plasma cells are lymphocytes that have been altered to produce immunoglobulin, an immune protein or antibody necessary for fighting disease
- A “clonal population of cells” is a clone of cells descended from a single cell; all of the cells have the same genetic make-up
- Multiple myeloma is an uncommon cancer derived from a clonal population of cancerous (malignant) plasma cells in the bone marrow
- Three of four defining features must be present for diagnosis of multiple myeloma: immune protein from a single clone of cells (known as a “monoclonal gammopathy”), seen as a spike in the gamma region of a protein analysis (known as a “protein electrophoresis”) of blood; cancerous (malignant) plasma cells or high number of plasma cells in the bone marrow (known as “plasmacytosis”); destruction of areas in the bone (known as “lytic bone lesions”); and a particular type of protein found in the urine (known as “Bence-Jones [light-chain] proteinuria”)

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats

Breed Predilections

- None

Mean Age and Range

- Primarily middle-aged or old dogs and cats (6–13 years)

SIGNS/OBSERVED CHANGES IN THE PET

- Attributed to bone infiltration and destruction of bone (lysis), effects of monoclonal proteins(immune proteins from a single clone of plasma cells) produced by the tumor (such as increased protein in the blood leading to sludging of the blood [known as “hyperviscosity”] and kidney damage), and infiltration of organ(s) by cancerous cells
- Depend on location and extent of disease

Dogs

- Bleeding—especially from the nose or mucous membranes (the moist tissues of the mouth, eyes, and other areas of the body)—seen in 37% of affected dogs
- Blindness, retinal hemorrhage, or dilated retinal vessels (35%); detached retina
- Lameness (47%), bone pain, sluggishness (lethargy) and weakness (62%)—with destruction of areas of bone

(lytic bone lesions)

Cats

- Lack of appetite (known as “anorexia”)
- Weight loss
- Generalized discomfort or uneasiness (malaise)
- Increased thirst (polydipsia)
- Increased urination (polyuria)

CAUSES

- Unknown

Treatment

HEALTH CARE

- Best to consult a veterinary oncologist for latest information regarding treatment
- Inpatient treatment if pet has excessive levels of urea and other nitrogenous waste products in the blood (known as “uremia” or “azotemia”), high levels of calcium in the blood (hypercalcemia), a bleeding disorder or clinically important bacterial infection
- Plasmapheresis (medical process in which whole blood is removed from the body, the blood cells are separated from the fluid portion of the blood and then are put into a sterile fluid and transfused back into the body), when available, lowers protein burden
- Pet with signs of increased protein in the blood leading to sludging of the blood (hyperviscosity)—the veterinarian may perform phlebotomy (a medical procedure in which an incision is made into the vein, for the purpose of withdrawing blood) and replace the volume of blood withdrawn intravenously with an equal volume of fluids
- Radiation therapy may be used on isolated areas with the goal of cure (known as “curative intent”) or to control signs and improve the pet's condition, but not to cure (known as “palliative intent”); radiation therapy is particularly effective for management of bone pain secondary to destruction of areas in the bone (lytic bone lesions), and for spinal cord compression
- Bacterial infection—will be treated aggressively with appropriate antibiotics; more prone to infections while receiving chemotherapy

ACTIVITY

- Treat pet as being unable to develop a normal immune response (known as “immune compromised”); take care to prevent bacterial infection (such as caused by puncture wounds from dog or cat fights)

DIET

- Dietary changes may be necessary, if pet is in kidney failure

SURGERY

- Areas nonresponsive to chemotherapy or single (solitary) lesions may be removed surgically

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

- Chemotherapy is intended to improve the pet's condition, but not to cure the multiple myeloma (palliative treatment); however, long remissions are possible
- Dogs—melphalan and prednisone; cyclophosphamide can be used in addition to or in place of melphalan
- Cats—melphalan and prednisone

Aminobisphosphonate drugs—control high levels of calcium in the blood (hypercalcemia), alleviate bone pain

Follow-Up Care

PATIENT MONITORING

- Complete blood count (CBC) and platelet count and chemistry panel—biweekly for at least 8 weeks to assess bone-marrow response to chemotherapeutic drugs, then monthly
- Protein analysis of blood (protein electrophoresis) and/or Bence-Jones urine protein monthly for several months, until normal protein patterns are obtained, then monitor periodically for relapse
- Abnormal skeletal x-rays (radiographs) should be repeated monthly, then every 2-3 months to evaluate response to treatment

POSSIBLE COMPLICATIONS

- Bleeding
- Secondary infections
- Fractures occurring at the site of weakened bone (known as “pathologic fractures”), due to the presence of multiple myeloma
- Chemotherapy may cause low white blood cell counts (known as “leukopenia”) or low platelet or thrombocyte counts (thrombocytopenia); lack of appetite (anorexia); hair loss (known as “alopecia”); bloody inflammation of the bladder (known as “hemorrhagic cystitis”); and/or inflammation of the pancreas (known as “pancreatitis”)

EXPECTED COURSE AND PROGNOSIS

- Even with treatment, it may be a month or two before improvement (3-6 weeks); follow up X-rays may take longer to improve, may be partial improvement only
- Continuous care must be taken to protect pets from secondary infection

Dogs

- Median survival with chemotherapeutic agents and prednisone—18 months
- Overall response rate over 90%
- High levels of calcium in the blood (hypercalcemia), extensive destruction of areas of bone (bone lysis), or presence of a particular type of protein in the urine (Bence-Jones proteinuria) often indicates shorter survival

Cats

- Survival with chemotherapeutic agents and prednisone—2–9 months

Key Points

- Chemotherapy is intended to improve the pet's condition, but not to cure the multiple myeloma (palliative treatment); however, long remissions are possible
- Relapse will occur
- Side effects are determined by the drugs used
- Most affected pets develop mild low white blood cell counts (leukopenia) with chemotherapy