Canine Mast Cell Tumor

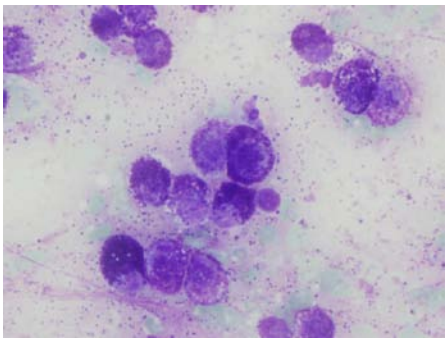
A PowerPage Presented By

Mast cell tumors (MCT) are the **most common dermal malignancy** in dogs. You will commonly encounter them in small animal clinical practice and should be prepared to answer a few questions about this common tumor.

Key Points

- Predisposed breeds: boxers, pugs, Boston terriers, other brachycephalic breeds
  - These breeds frequently develop multiple (occasionally many) MCTs over their lifetime, but are usually associated with lower grade tumors that are less aggressive in metastasizing
- Mast cell granules release **histamine, heparin,** proteases, and cytokines when they degranulate
  - May cause **GI ulcers**, bleeding, poor wound healing, anaphylactoid reactions (vasodilation, hypotension, collapse, etc)
- Most common grading system for MCTs used in the US is the Patnaik system
  - Evaluates cell differentiation, mitotic figures, and invasiveness in surrounding tissues
  - Grade predicts likelihood for recurrence and metastasis where a grade 3 is most aggressive, 2 is intermediate, and 1 is least aggressive
  - Only MCTs arising from skin are graded
- Considered the "great pretender" as they can look and feel like anything from a skin plaque, nodule, rash, or lipoma

Diagnostics



- **Fine needle aspirate cytology**
  - Usually effective and the least invasive way of attaining a diagnosis
  - **Grade can NOT be determined by cytology**
  - Eosinophils are commonly abundant in samples
- **Biopsy**
  - Occasionally required for diagnosis if FNA is non diagnostic
  - Required for grading
- **Fine needle aspirate or biopsy of regional draining lymph node**
- **Abdominal ultrasound and thoracic radiographs**
  - If clinically indicated for aggressive MCTs with high risk for metastasis
  - To evaluate abdominal lymph nodes, liver, spleen, and thoracic lymph nodes, respectively
- **Buffy coat analysis or bone marrow aspirate**
  - Infrequently performed with low yield

Treatment

Surgery

- Excision with 2-3 cm lateral margins and 1 fascial plane deep
- Treatment of choice if metastasis not already present

Radiation therapy

- Adjuvant treatment to surgery if complete margins cannot be obtained

Chemotherapy

- Vinblastine, CCNU or other alkylating agents
- Indicated if metastasis present, at high risk for developing metastasis or recurrence, or if surgery or radiation are not options

Supportive care

- Glucocorticoids (**prednisone**)
  - Cytotoxic to mast cells
  - Stabilizes mast cell membranes
  - Reduces inflammation associated with tumor
- H1 blocker - **diphenhydramine**
- **H2 blocker** - famotidine, ranitidine, etc

Tyrosine kinase inhibitor

- Toceranib (Palladia)
  - First FDA-approved drug for canine cancer in the United States
  - Inhibits aberrant cell signaling pathways found in MCTs (KIT, VEGFR 2, PDGFR beta)
- Others to come to market soon

Prognosis

Prognostic factors

- **Grade**
  - Grade 1: least likely to metastasize or recur (<10%)
  - Grade 2: up to 80% of all MCTs will be grade 2 (<25% will metastasize)
  - Grade 3: most aggressive with metastasis rates between 50-90%, and survival times between 6 months to 3 years
- **Clinical stage**
  - Evidence of lymph node or distant metastasis associated with worse prognosis
- **Mitotic index**
  - >5 mitoses/ 10 high power fields associated with shorter survival
- **Other proliferation markers**
  - Ki-67, PCNA, AgNOR
- **Tumor location**
  - Viscera - poor prognosis
  - Mucosa or mucocutaneous junctions - more aggressive with higher risk of metastasis
- **Tumor size**
- **Rate of growth**
- **Clinical signs**
  - Systemic signs such as anorexia, vomiting, diarrhea due to the tumor associated with a poor prognosis
- **Local recurrence after resection**
- **Breed**
  - Boxers, pugs, and possibly other brachycephalic breeds associated with low to intermediate grade tumors
- **KIT mutation**
  - Presence of mutation associated with worse prognosis