

Clinical Experience on Tumors of the Bernese Mountain Dog

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From September 1987 – December 1988 he was a Visiting Assistant Professor at the School of Veterinary Medicine (Purdue University, Indiana) with a grant from the Italian Association of Cancer Research where he developed his clinical activity based on diagnosis and therapy of feline and canine spontaneous tumors.

Prof. Buracco focused his presentation on the most frequent tumors of the Bernese Mountain Dog. If it is true that BMDs may be affected by all types of tumors, it is also true that in this breed there is a clear prevalence of the histiocytic disorders (over 70% in the author's experience) . Also, it is his impression that at the Veterinary Teaching Hospital of Grugliasco, BMDs are presented for a clinical examination almost exclusively because of orthopedic or oncological disorders. BMDs consist of less than 2% of all dogs examined.

Non histiocytic neoplasms that may affect BMDs include round cell tumors (mostly lymphoma and mast cell tumors), primary bone tumors (osteosarcoma), various soft tissue sarcomas and malignant epithelial tumors (mostly oral).

Histiocytic disorders are histologically not well defined. The cell of origin is the histiocyte, that belongs to the myeloid and Langerhans/dendritic cellular lineages. Immunohistochemistry is essential to recognize it.

Clinical syndromes associated with a histiocytic proliferation that are more frequently observed in BMSs are:

Systemic histiocytosis – seen in BMDs, Goldens, Rottweilers, Dobermans, and Saint Bernards. It could be a benign version of malignant histiocytosis. The disease involves skin (flank, muzzle, nasal plane, eyelids and scrotum), peripheral lymph nodes and less frequently episclera and conjunctiva. Microscopic extension to internal organs is possible. Affected Berners are usually middle age or younger, with only a slight predilection of males. The course of the disease is chronic, with a periodical worsening of the lesions. Survival is often more than 18 months and euthanasia is chosen by the owner because of the progressive debilitation.

- Seen slightly more in males
- Likely familial, polygenic inheritance
- Benign cutaneous lesions
- Peripheral lymph node involvement
- Less malignant than MH
- Chronic, waxing and waning
- Skin lesions
- Ocular signs

- Lethargy, cachexia, weight loss
- Rarely fatal
- Often euthanized because of the chronicity of the disease
- Poor response to steroids or chemo
- Use leflunomide or cyclosporine-A
- Survival is 2 – 48 months, the median survival time is 9 – 10 months

Localized histiocytic sarcoma – a localized form of the disease seen more often in distal parts of the limbs. Amputation may be an option, but accurate staging has to be performed before proceeding. It may evolve to malignant histiocytosis

Malignant histiocytosis – seen in BMDs, Goldens, Rotties, and GSDs

- Rapidly progressive with systemic metastasis
- Median age is 6 years
- Both sexes equally at risk
- Polygenic inheritance
- Dyspnea, neuro
- Anemia
- Disseminated – lungs, lympho, liver, spleen
- Bone involvement & pleural effusion less frequent
- Diagnosis:
 - o Abdominal ultrasound
 - o Chest x-ray
 - o Skeletal x-ray
 - o Biopsy – to rule out lymphoma, lung carcinoma, plasmacytoma, myeloma
 - o Bone marrow and CSF
 - o Hyperferritemia
 - o Altered coagulation
- Clinical Course:
 - o Rapid and fatal
 - o Poor response to chemo – doxil, liposomal doxil – results better with doxil & liposome
 - o Doxi rubichina
 - o TALL-104 - not thought to be a trial of MH, dog thought to have had SH

Other tumors frequently observed in BMD are:

Osteosarcoma

- Most frequently in distal metaphysis of radius

- Overweight dogs at higher risk, chronic trauma to limbs
- Also distal tibia and humerus
- Large and giant breeds
- 5 – 7 years of age
- More males, but more Rottie females
- Classification may be radiological (central, periosteal, parosteal) and histological (osteoblastic, chondroblastic, fibroblastic, telangiectasic, etc)
- Diagnosis: X-ray of the primary lesion and chest, ultrasound, fine needle aspirate, biopsy
- Treatment: Amputation, Limb sparing for the appendicular form, en bloc resection for the other localizations if feasible. Adjuvant (postsurgery) chemotherapy is essential to control the metastatic disease
- Bone cancers in increasing degree of metastasis:
Hemangiosarcoma, osteosarcoma (85% of bone tumors), chondrosarcoma, fibrosarcoma, giant cell, synovial cell

Osteosarcoma Treatment:

1. amputation – needs to be orthopedically normal, has to be able to stand without the limb
2. limb sparing – he wouldn't do it on his own dog, he prefers amputation. This may be done in several ways using bone coming from a bone bank, using the same bone after killing the tumor cells, a metallic prosthesis or using a technique of bone regeneration (Ilizarov)

Expected outcome:

With amputation or limb sparing

With chemo, 20 – 23% of the dogs will survive to 2 years

Without chemo, the prognosis is 3 – 4 months

He does not recommend amputation or limb sparing if chemo is not going to be used.

Other tumors are soft tissue sarcomas whose prognosis depends on localization (possibility to remove completely the tumor). Usually these tumors are characterized by a low metastatic rate but malignancy is mostly local (infiltration): this requires that the tumor is removed with at least 2-3 cm of tissue around the tumor to assure a long survival.

Mast Cell Tumors

- all breeds, mainly seen in the Boxer
- 9 years is the median age
- Histological grading in I, II, or III grade (III is more malignant)
- Associated with gastric ulcers, hypotension, coagulation abnormalities, wound dehiscence
- Survival depends on grade and clinical staging
- Treatment
 - o 25% resist treatment
 - o Surgery must be performed respecting the principle of 3cm margins
 - o Chemo is not curative but may prolong survival in unoperable cases or in case of recurrence
 - o Radiotherapy – if the margins are infiltrated

Lymphoma

- Survival is depending on clinical stage (I to V) and immunotype (B, T, nonB-nonT).
- B -Cell responds better to chemo