Concurrent Chemoradiotherapy: What Is the Risk?

Cheryl Balkman, MS, DVM, DACVIM (Internal Medicine, Oncology)
Cornell University

In the Literature

Chemoradiotherapy is considered the standard of care for certain cancers in humans and, although less common, has been used in veterinary patients. Chemoradiotherapy involves administration of chemotherapeutic agents prior to and during the course of radiation therapy as a radiation sensitizer to improve the response to local radiation, for the treatment of advanced locoregional disease, or for both local and systemic effects on tumors with a high metastatic potential.

Patients with incompletely excised high-grade or metastatic tumors require adjunctive therapy (ie, radiation and chemotherapy) to provide both adequate local and systemic control of their tumors. Although using these treatment modalities simultaneously can shorten overall treatment time, the risk for hematologic toxicity can be increased. This study aimed to determine whether dogs with microscopic mast cell tumors treated with radiation therapy and vinblastine/prednisolone demonstrated increased myelosuppression as compared with dogs treated with only vinblastine/prednisolone.

Forty-three dogs were treated with a combination of radiation therapy and vinblastine/prednisolone (RT/VBL/Pred); another 43 dogs were treated with vinblastine/prednisolone alone (VBL/Pred). Eight dogs (19%) in the RT/VBL/Pred group experienced neutropenia (6 VCOG [Veterinary Cooperative Oncology Group] grade I, 1 VCOG grade II, and 1 VCOG grade IV neutropenia) that resulted in a delay of chemotherapy, and 1 dog had a 10% dose reduction. Ten dogs (23%) in the VBL/Pred group experienced neutropenia (4 VCOG grade I, 2 VCOG grade II, and 4 VCOG grade III neutropenia), necessitating a dose delay in 10 dogs and a 10% dose reduction in 1. There was no significant difference in the frequency of neutropenia between the RT/VBL/Pred and VBL/Pred groups. The authors state that the study may have been underpowered to detect a difference.

Although no increased risk for myelosuppression was shown when radiation therapy was administered simultaneously with vinblastine and prednisolone, this may not be the case when other chemotherapy agents are used. Other factors that can influence the risk for myelosuppression when combining radiation with chemotherapy include the radiation protocol (ie, number of fractions and total radiation dose) and the amount of bone marrow in the radiation field. In humans, a major factor associated with neutropenia or thrombocytopenia during radiation therapy is the percent of marrow being irradiated.
Suggested Reading
Veterinary Cooperative Oncology Group—common terminology criteria for adverse events (VCOG-CTCAE) following chemotherapy or biological antineoplastic therapy in dogs and cats v1.1. Vet Comp Oncol. 2016;14(4):417-446.

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