

Treatment of spontaneous tumors in pet animals as part of the development of a new radiation treatment modality

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Rationale and objectives

Treatment of spontaneous (autochthonous) benign and malignant tumors in animal patients is considered a major step between experiments on laboratory animals and humans. The dimensional and physiological characteristics of spontaneous tumors of dogs and cats have more similarity to many human malignancies than implanted tumors of mice and rats. The biological response of tumors and normal tissues is dependent on the volume irradiated. For MRT the radiation quality, i.e. peak to valley dose ratio (PVDR) is also volume dependent. Obviously, treatment of pet animals involves a more heterogeneous treatment population and smaller numbers of animals can be included into a study. However, the model is more realistic and a closer follow up done by the owners can be done. An important aspect for the implementation of a new radio-oncology modality is the testing of all practical procedures, from treatment planning to follow up care.

Methods

Animal patients eligible are: Animals with a) small, superficial skin or subcutaneous tumors b) superficial benign or malignant tumors of the central nervous system d) other neoplasms to be considered individually. Six animals per group should suffice for a preliminary evaluation of normal tissue tolerance and sensitivity to MRT. A dose escalation will be performed, starting at a conservative dose, expected to produce no significant side effects. After an observation period of at least 6 months the dose will be escalated in small steps to determine the optimal dose.

Results

In the past, the treatment of dog patients with protons at Paul Scherer Institute, Villigen has contributed to the establishment of routine human patient treatment procedures. It has further shown that the spot scanning technique for protons, developed at PSI, was safe and did not lead to any unexpected biological response.

Conclusion

The treatment of spontaneous animal tumors can be to the benefit of the animal treated and at the same time give valuable information for a safe start of a human patient program.