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Comparative Oncology: Evaluation of 2-Deoxy-2-[18F]fluoro-D-glucose (FDG) Positron Emission Tomography/Computed Tomography (PET/CT) for the Staging of Dogs with Malignant Tumors.

Abstract:
2-Deoxy-2-[18F]fluoro-D-glucose PET/CT is a well-established imaging method for staging, restaging and therapy-control in human medicine. In veterinary medicine, this imaging method could prove to be an attractive and innovative alternative to conventional imaging in order to improve staging and restaging. The aim of this study was both to evaluate the effectiveness of this image-guided method in canine patients with spontaneously occurring cancer as well as to illustrate the dog as a well-suited animal model for comparative oncology. Ten dogs with various malignant tumors were included in the study and underwent a whole body FDG PET/CT. One patient has a second PET-CT 5 months after the first study. Patients were diagnosed with histiocytic sarcoma (n = 1), malignant lymphoma (n = 2), mammary carcinoma (n = 4), sertoli cell tumor (n = 1), gastrointestinal stromal tumor (GIST) (n = 1) and lung tumor (n = 1). PET/CT data were analyzed with the help of a 5-point scale in consideration of the patients' medical histories. In seven of the ten dogs, the treatment protocol and prognosis were significantly changed.
due to the results of FDG PET/CT. In the patients with lymphoma (n = 2) tumor extent could be defined on PET/CT because of increased FDG uptake in multiple lymph nodes. This led to the recommendation for a therapeutic polychemotherapy as a treatment. In one of the dogs with mammary carcinoma (n = 4) and in the patient with the lung tumor (n = 1), surgery was cancelled due to the discovery of multiple metastasis. Consequently no treatment was recommended. FDG PET/CT offers additional information in canine patients with malignant disease with a potential improvement of staging and restaging. The encouraging data of this clinical study highlights the possibility to further improve innovative diagnostic and staging methods with regard to comparative oncology. In the future, performing PET/CT not only for staging but also in therapy control could offer a significant improvement in the management of dogs with malignant tumors.

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