

## DIFFUSION-WEIGHTED IMAGES AND PET / CT IN THE DIAGNOSIS OF CANCER OF THE ABDOMINAL CAVITY

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*Introduction.* In recent years, due to the trend towards an increase in the proximal part of the stomach cancer with the transition to the cardia, renewed interest in the use of diffuse changes in the weighted (DWI) and PET / CT. This can be useful for diagnosis and restaging recurrences at an earlier date or with greater confidence, and also be useful in determining response to chemotherapy

The aim of our study was to investigate the use of a new direction of DWI and PET / CT can provide systematic and functional approach to screening and early diagnosis of cancer of the abdominal cavity.

*Material and methods.* We conducted diffusely-weighted MRI and pseudo - PET using a 1.5 T imager Toshiba Vantage Atlas with different cancer pathology abdominal (stomach cancer, abdominal cavity, lymphoma, pancreatic cancer, colon cancer) . DWI principle is to examine the rate of diffusion of free liquid hydrogen atoms in the zone and recorded with the help of MRI with automatic construction of ICD (by measuring the diffusion rate of free fluid in the tissue, that we can judge the state the tissue at the cellular level). We studied two-stage analysis of DWI: qualitative - visual signal strength rating images produced by MRI scanning and determination quantitative - measured diffusion coefficient (ICD) in the reconstructed maps of the DCO. Determination limit the diffusion - bright signal on DWI and reduced signal in the ICD-map. PET / CT scans were performed using radiolabeled Ftor-18-deoxyglucose (FDG) before treatment and during the therapy.

*Results of the study.* When diffusion (ICD) coefficients in solid tumors and cell density higher than in normal tissues, decreases diffusion. In malignant tumors, cell density higher than that of the benign tumors and decrease the diffusion to a greater extent. The use of diffusion-weighted imaging in practice, provide a measure of the diffusion coefficient in addition to ICD morphological features of the tumor. When studying the ICD during cancer therapy it has been found that for effective treatment of the tumor is reduced and the number of cells (necrosis, apoptosis), and there is an expansion space and intercellular diffusion increases. PET / CT allows you to visualize and quantify the level of glucose metabolism in tumor tissue, to promote the creation of malignancy to determine tumor stage and to evaluate the effectiveness of the therapy

*Conclusions.* DWI plays an important role in oncology from screening stage of the process to establish and monitor the effectiveness of treatment. The method is useful in the diagnosis of metastatic lesion formations and does not require administration of contrast material, as in the CT and MRI or PET/CT . The advantages of DWI on FDG PET is its high spatial resolution. However, PET / CT is more effective than. DWI. PET / CT more accurately identifies the malignant tumors and their metastases in the abdomen. PET / CT provides a significant advantage in improving the diagnosis and therapeutic monitoring of patients, monitors the responses to treatment. Weaknesses PET / CT include low specificity for different types of tumors, false positive results due to inflammation or granulation changes. Also, the weak point is the radiation exposure (~ 30 mSv per study -Brix et al., 2001).