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A CLINICAL STUDY FOR DIAGNOSIS OF ORBITAL PSEUDOTUMOR BY POSITRON CT USING F-18-FLUORODEOXYGLUCOSE. M.Kiyosawa, M.Ohmura, K.Mizuno, H.Fukuda, J.Hatazawa, S.Yoshioka, M.Ito, T.Matsuzawa, S.Watanuki, T.Ido. Tohoku University, Sendai.

Orbital pseudotumor is the most common and important disease in orbital clinic. This is the first report of orbital tumors examined by positron CT. F-18 -FDG were employed for this study. FDG study has much advantage in evaluating glucose metabolism in tissues because FDG is a trapping agent in glycolysis. Positive images of orbital pseudotumor were obtained in each patients. High and increasing radioactivities were obtained in a malignant lymphoma. Time activity curve of typical early clearance type was observed in a case with a histological diagnosis of scar tissue with chronic inflammation. The effectiveness of this examinations in orbital tumor diagnosis were suggested in this study.

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LUNG TUMOR IMAGING BY POSITRON EMISSION TOMOGRAPHY USING CARBON-11-L-METHIONINE. K.Kubota, T.Matsuzawa, M.Ito, K.Ito, T.Fujiwara, H.Fukuda, Y.Abe, S.Yoshioka, J.Hatazawa. Res.Inst.Tbc & Cancer, Tohoku Univ. S.Watanuki, R.Iwata, T.Ido. Cyclo RI Center Tohoku Univ., Sendai.

We describe the first clinical study of lung tumor scanning by positron emission tomography (PET) using ^{11}C -labelled-methionine (^{11}C -L-Met). Tumor images were clearly visualized by high contrast in eight lung cancer patients and also in patient with silicotic tumor. Quantitative evaluations of methionine uptake in tumor tissue and normal tissue by comparing differential absorption ratios suggested that the extent to which ^{11}C -L-Met accumulates in a tumor is closely correlated to the tumor's viability such as benign or malignant, viable or necrotic. ^{11}C -L-Met is considered to be an effective tumor marker for PET diagnosis which represents increased amino acid metabolism of tumors in the mediastinum and lung.

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18-F-2-FLUORO-2-DEOXYGLUCOSE (FDG) POSITRON EMISSION TOMOGRAPHY OF HUMAN LUNG CANCER. T.Fujiwara, M.Ito, H.Fukuda, K.Yamada, Y.Abe, K.Kubota, J.Hatazawa, S.Yoshioka, K.Ito, T.Sato, T.Matsuzawa, S.Watanuki and T.Ido. Res.Inst.Tbc and Cancer Tohoku Univ. Cyclo.RI Center Tohoku Univ, Sendai.

In order to learn the viability of tumor cells and their proliferative or invasive activity, FDG study was performed by positron emission tomography on 12 patients who had lung lesions. Every tumor, except one which was close to heart, was clearly visualized by FDG with high contrast. The FDG uptakes of tumors were high and increased almost linearly with time during 40 minutes of study period, where granuloma and pneumonia showed low uptakes and little increases of FDG. Quantitative evaluation of FDG uptakes in tumors by comparing differential absorption ratio suggested that FDG scan was useful for in vivo assessment of metabolic activity in tumors and that uptakes of FDG might be corrected to cell types of tumors. In 4 patients, C-11 methionine uptake was studied before FDG scan. All tumors, including one which was not visualized by FDG, showed positive images and were constant levels of C-11 activity.

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AUTORADIOGRAPHIC STUDY OF REGIONAL MYOCARDIAL ISCHEMIA IN THE RAT. Y.Miura, Y.Kagaya, E.Nozaaki, N.Ishide, Y.Maruyama, T.Takishima, T.Takahashi*, K.Ishiwata* and T.Ido*. First Department of Internal Medicine, and Cyclotron and Radioisotope Center*, Tohoku University, Sendai.

The spread of ischemia in the rat heart was investigated using autoradiography with C-14 deoxyglucose (CDG). High uptake area of CDG in 1 or 2 mm width was shown around the border of ischemia. Such area was prominent just after the left coronary artery occlusion, but reduced in width as increase of occlusion times, and finally vanished in some cases. We also performed Methylene blue staining to delineate normal perfused area. At 30 minutes after coronary artery occlusion, the borderline of CDG uptake was not consistent with the line delineated by Methylene blue staining, whereas at 360 minutes after occlusion, the two lines were completely matched. This technique seems to be useful to elucidate the behavior of the border area around ischemia.