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CLINICAL EVALUATION OF SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY IN DIAGNOSIS OF BRAIN TUMOR. T.Mamiya,N.Yui,F.Kinoshita,M.Koakutzu\*,Y.Akiyama\*\*,T.Takashima\*\*\* and N.Arimizu\*\*\*\*. \* Division of Nuclear Medicine, \*\* Physics Division, \*\*\* Division of Neuro Surgery, Chiba Cancer Center, Chiba, \*\*\*\* Department of Radiology, Chiba University, Chiba.

We have applied single photon emission computed tomography (SPECT) for diagnosis of brain tumor. SPECT images following the conventional images were taken immediately, at 30 min and 4 hours after injection of 20m Ci of Tc-99m per technetate or gluconate. Thirty two patients with various brain disease were examined and 26 of them were patients with brain tumors. There was no significant difference of sensitivity between SPECT and the conventional method in localization of brain tumors. However, we think that combination of SPECT to conventional method has improved the diagnostic quality by classification of the uptake pattern of radio nucleid in the lesions according to periodical change. We also think that SPECT is a useful method to separate the recurrent lesion from the surgical scar. Key words: SPECT, brain tumor, diagnostic quality.

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BRAIN METABOLISM OF EPILEPTIC FOCUS BY POSITRON COMPUTED TOMOGRAPHY. H.Shimizu,B.Ishijima and M. Iio, Tokyo Metropolitan Neurological Hospital and National Nakano Chest Hospital. Tokyo.

The authors have performed positron emission computed tomography in thirteen epileptic patients in which the clinical seizures and/or electroencephalographic findings indicate localized cortical foci. They comprise motor (4), visual (4), psychomotor (3), and sensory (2) partial epileptics.  $^{11}\text{C-CO}_2$  and  $^{11}\text{C}$ -glucose were employed to study local cerebral perfusion and glucose metabolism respectively. The results showed that local cerebral metabolism was remarkably decreased around the cerebral cortex corresponding to the epileptic focus in 10 (77%) cases. Cerebral perfusion and glucose metabolism always changed in parallel. The hypometabolic areas in foci were always wider than expected by EEG and X-ray CT studies. According to our chronic epileptic model of cobalt rats, the cortical focus displays a wide low metabolic area surrounded with a thin hyperactive zone. In the positron CT study with a relatively poor spatial resolution, this active area might be neglected yielding as the result the image of a hypometabolic extent around foci.

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PET OF LEUKODYSTROPHIES. A.MATSUI, N. SAKURAGAWA, M.TOJO NATIONAL CENTER FOR NERVOUS, MENTAL AND MUSCULAR DISORDERS. M.IIO NAKANO HOSPITAL. TOKYO.

PET with  $^{11}\text{C-CO}_2$  and glucose was performed in three cases of different types of leukodystrophy. In juvenile type of metachromatic leukodystrophy, PET revealed high cortical and low subcortical activities, which were compatible with low density of white matter on X-ray CT and pathological changes of dysmyelination with tendency of preservation of gray matter. Adrenoleukodystrophy showed pathologically severe demyelination and active reaction of macrophages forming perivascular cuffs. From PET findings, cortical hypoactivities were predictive of profound neuronal damages. And it was very interesting whether subcortical high activities indicated reactive vascular changes or relatively saved subcortical U-fiber areas. The third case, unidentified type but clinically suspected to be Alexander type, showed hypoactivities of frontal gray and white matters on PET. Clinical pictures were compatible with these findings. Perivascular accumulation of Rosenthal fibers in addition to diffuse demyelination and neuronal involvement were pathological features for Alexander disease. PET findings in this case were also suggestive of this uncommon disease like as clinical pictures. PET appears useful for differential diagnoses of leukodystrophies and understandings of pathological backgrounds.

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POSITRON CT OF CHRONIC SCHIZOPHRENICS. J.Toyoda,T.Miyazaki,Y.Sugai and M.Iio. National Musashi Institute for Mental and Nervous Disease.National Nakano Hospital. Tokyo.

On 15 schizophrenics ill over 3 years (13 male and 2 female, mean age:41.8 years) and 5 normal male control (mean age:53.8 y.), positron CT was studied. Schizophrenic cases were all under anti-psychotic drug. C-11  $\text{CO}_2$  inhaled once immediately before recording and C-11 glucose by photosynthesis administered orally 10-15 min. before were used as tracers. Studied scan level was 4-5 cm above OM line. Topographical differences of relative radioactivities were examined visually on the images. Findings observed especially on the schizophrenic cases were (1) Hypofrontal radioactivities with both C-11  $\text{CO}_2$  and C-11 glucose in 7 cases.

(2) Different distribution of radioactivities between C-11  $\text{CO}_2$  and C-11 glucose in 4 cases.

(3) Minimized difference between radioactivities in brain and those in scalp tissue with C-11 glucose in 11 cases.

On the analysis of correlations of these findings with present age, age of onset, duration of illness, clinical symptoms, drug amount, EEG and X-R CT findings, significant correlation was between (1) and clinical apathy and abulia as main symptom. All cases with (1) had these symptoms and 63.5% of cases with these symptoms showed (1).