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THE EFFECTS OF ACUPUNCTURE RECORDED BY POSITRON ECT. (II). T.Yano, A.Ozaki, K.Mori, H.Toyama, A.Iio, T.Tsukiyama, and K.Sasaki. Meiji College of Oriental Medicine, Kyoto. National Nakano Chest Hospital, Tokyo. Nippon Univ. Tokyo.

Positron ECT was conducted on both healthy people and medical patients (suffering from CVA, encephaloma, etc.) who received electro-acupuncture stimuli on their Hoku and Shou-Sanli. The activity of the brain under these stimuli was recorded. Next, the chronological change in the ROI region in question in the thalamus of the subjects was studied in further detail by an image processing method. In a total study of positron CT images in cases 1 through 10, it was learned that nervous cell activities were promoted in the cortex area in the side opposite to that of stimulation, or in both sides in some cases. These results clearly indicate that acupuncture worked by a specific mechanism acting simultaneously on two systems, the reticular activating system and the hypothalamic controlling system, to tranquilize brain activity, remove tension in the muscles, and effectively regulated the function of the autonomous nervous system.

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DIFFERENTIATION BETWEEN TUMOR AND INFLAMMATION BY POSITRON EMISSION TOMOGRAPHY USING ^{18}F -5-FLUORO-2'-DEOXYURIDINE. K.Ishiwata¹, T.Ido¹, M.Kiyosawa², K.Mizuno², H.Fukuda², Y.Abe², T.Matsuzawa², M.Monma¹ and S.Watanuki¹. ¹Cyclotron and Radioisotope Center, ²School of Medicine, ³Research Institute for Tuberculosis and cancer, Tohoku University, Sendai.

We have reported the usefulness of ^{18}F -5-fluoro-2'-deoxyuridine (FdUrd) to diagnose tumors by positron emission tomography (PET). Since tumor uptake of ^{18}F -FdUrd depends upon the nucleic acid metabolism, ^{18}F -FdUrd is a hopeful positron emitting tracer to differentiate the tumors and inflammation.

The ^{18}F -FdUrd uptakes in the tumors (AHL09A or VX2) and the aseptic inflammation induced by croton oil were examined in rats and rabbits by tissue sampling and PET, respectively. In both animals, the uptake of ^{18}F -FdUrd in the inflammation was low and its concentration was similar to those in the blood. However, the tumor uptakes decreased gradually with time, but the uptake ratios of tumor-to-blood or -other tissues surrounding orbit were always larger than those of inflammation-to-same tissues. Therefore, PET using ^{18}F -FdUrd is expected to be able to differentiate the tumors and inflammation.

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AN OUTLINE OF CLINICAL USE OF POSITRON CT AND SEVERAL EQUIPMENTS IN GUNMA UNIVERSITY HOSPITAL. T.Shibasaki, T.Ishihara and T.Nagai. Gunma University, Maebashi, Gunma.

Since January 1984, 120 PCT studies with continuous inhalation of O-15 oxygen and carbon dioxide were made; 5 studies in 4 subjects without CNS disorder, 47 in 39 CVD (including 23 in 18 Moyamoya disease), 19 in 17 brain tumor cases, 18 in 13 cases with stereotactic surgery for central pain, essential tremor or Parkinson's disease, 7 in 7 epileptics, 6 in 3 hydrocephalics and so on. Recording of movements of thorax and RI activity in head are useful to check the constancy of RI inhalation. TV recording of extremities of the subject and surface EMG are performed in cases with movement disorders. EEG with 2 to 4 leads during PCT study indicates the consciousness level of the subject and EEG with full 16 leads just after PCT is analysed to make electrophysiological mapping. All parameters mentioned above are simultaneously recorded on a magnetic tape. Another TV system with video-unit and camera for the subject is used to give various visual stimulations and questions as mental tasks, and to guide physical tasks. The subject, particularly younger or emotionally impaired patients, can see his familiar person on the TV and feels relaxed, which may serve to prevent unnecessary movements and anxiety of the subject. Clinical departments in Gunma University Hospital participating the PCT project have various disease protocols on each fields.

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Present status of the cyclotron laboratory and quantification of positron CT images in Gunma university hospital. T. Ishihara, T. Nagai and T. Shibasaki*. Dept. of Radiology and *Neurosurgery, Gunma university hospital, Maebashi, Gunma.

The cyclotron laboratory was established in May 1983, and was set up the positron CT system in Dec. 1983. Clinical study was started at Feb. 1984. This report is described the laboratory and quantification of the positron CT images. The cyclotron laboratory has two floors which includes the cyclotron room, hot lab., positron CT room and their operating room in the first floor. These rooms are nearly same distance from the operating room. It is very easy to operate the laboratory with few persons. There are power supply units, air conditioning apparatus and radiation safety apparatus in the second floor.

The positron CT system and X-ray CT put together in the positron CT room. This system are designed to get same slices with positron CT and X-ray CT images using one bed. The positioning accuracy of the system is less than 1 mm. Clinical study of brain diseases be done using $^{15}\text{O}_2$ and Cl^{50}_2 gases with steady state method and are calculated regional cerebral blood flow, regional cerebral metabolic rate of oxygen and regional oxygen extraction rate. There are many kinds of factors affecting the quantification of the positron CT images. In this report, these several factors are investigated and discussed.