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CLINICAL EXPERIENCE OF SPECT IN THE PATIENTS WITH BRAIN TUMORS. K. Suzuki, T. Okawada, M. Ogasawara, S. Nogami, R. Kawakami, S. Akita, C. Kusano, S. Kuroda, T. Mezaki, M. Fukushi*, A. Goto*, T. Hashimoto**, K. Ogawa** and A. Kubo**, Metropolitan Komagome Hospital, Tokyo Metropolitan College of Allied Medical Sciences*, Tokyo, Keio University School of Medicine**, Tokyo.

SPECT was performed in 20 patients with brain tumors using I-123 IMP and Tc-99m HSA. Dynamic SPECT was carried out in 8 cases. The SPECT value in ROI provided in the affected area was compared with that in the opposite side. Distribution of IMP is generally low in uptake in the affected area, but there is one exception of glioblastoma showing high accumulation of IMP in the tumor. Time activity curves obtained by dynamic study show early accumulation of IMP into the vascular tumor. However, the curves had become lower than those of normal brain parenchyma in late phase. The curves had become flat after radiation therapy. SPECT using Tc-99m HSA reveals RN accumulation to be increased in proportion with hypervascularity of the tumor. In radiation necrosis, there is no accumulation of HSA, although CT image shows marked contrast enhancement. The findings may be useful for differentiation between tumor recurrence and radiation necrosis.

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SIGNIFICANCE OF MEASURING CEREBRAL BLOOD FLOW OF PATIENT'S SUFFERING FROM CONVULSIONS. Eishi Arisaka. Ohkawara Neurosurgical Hospital

A study was conducted on whether (1) measurement of cerebral blood flow using SPECT on patients suffering from convulsions, can be useful in any way in understanding a patient's condition during convulsions and (2) to clarify the changes in cerebral blood flow when Todd's paralysis occurs after a convulsive attack.

Tomomatic 64 was used in 16 cases of patients coming to the hospital due to spasm since November, 1984. (2 cases of trauma, 1 tumor, 1 AVM, 1 venous angioma, 1 Sturge Webers' D, and 10 cases of Epilepsy). The cerebral blood flow was measured intermittently, just after the attacks.

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RAPID SEQUENCE SPECT BY HEADTOME AND ITS USEFULNESS. A. Komatani, K. Takahashi, K. Yamaguchi and N. Yamaoka*. Department of Radiology, Yamagata University School of Medicine and Shimadzu CO.

Rapid sequential SPECT (RSS) with ring detector SPECT "HEADTOME" was developed and its usefulness was evaluated.

The data acquisition for a trans-axial tomography was proceeded as follows. The turbo-fan collimator was rotated 180° in stepping by 10°, after turning of detector-ring by a half of detector width (2.8°), the second 180°-stepping rotation of the collimator was performed. It took 12 seconds at least for the process. In order to prevent the artifacts due to rapid change of radioactivity during the data acquisition, normalized data in each 12 seconds was employed for the construction of a trans-axial tomography. The artifact was so diminished even in the arterial phase of RI angiography of the brain. Some parametric images of filling rate or wash out rate were also prepared in application of the sequential images. These parametric images were expected to make good the quantitative uncertainty of the SPECT due to the absorption correction. Usefulness of the RSS in the investigation of various brain disease were also presented.

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rCBF IN CEREBROVASCULAR DISEASE: A SIX DETECTOR RINGS SPECT STUDY. K. Sone, T. Tanaka, S. Kawatsu and Y. Izumi, Tomioka Memorial Hospital, and N. Yamaoka, Shimadzu Cooperation, Osaka.

A six detector rings system was developed with the help of Shimadzu Cooperation. The spatial resolution (FWHM) for ^{99m}Tc is 8.6mm at the center and 8.0mm at the 8cm radius, with a high resolution collimator. The sensitivity for ^{99m}Tc is 4.3 Kcps Ci ml and 21.5 Kcps Ci ml with a high resolution and a high sensitivity collimator, respectively.

Nine patients with cerebral infarction, five with intra-cerebral hemorrhage and five with TIA were studied. ¹³³Xe SPECT was taken by one minute inhalation method. ¹²³I-IMP SPECT was taken by intravenous injection of 3.5mCi ¹²³I-IMP. The data acquisition started at 30 minutes after the injection and continued for 15 minutes. After the first 15 minutes acquisition, the patient head was moved down 9mm for the next 15 minutes acquisition. Therefore, 12 slices of IMP-SPECT were taken and coronal plane and sagittal plane were made to know 3-dimensional view of the brain.

In the nine cerebral infarction and the five intracerebral hemorrhage cases, ¹³³Xe SPECT and ¹²³I-IMP SPECT showed the abnormalities which correlated with X-ray CT findings, while the size of abnormality were large than the X-ray CT. And, in most of the cases were revealed a remote change in contralateral hemisphere or cerebellum.

This study suggested that the 6 detector rings system is able to detect flow abnormalities in cerebrovascular disease and offer a more 3-dimensional information than 3 detector rings system.