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IMAGE PROCESSING OF THE TOMOMATIC-64 ECT IMAGES USING THE MINI-COMPUTER SYSTEM.

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Image processing of the Tomomatic-64 ECT images were studied using the mini-computer system.

- (1) The 32x32 matrix ECT images were converted to 256x256 matrix, and these images were displayed to monochromatic TV monitor. ECT images were observed clearly in comparison to the colour images by tomomatic system.
- (2) The FWHM of point spread function in tomomatic-64 ECT image was 7.2 mm. Image quality was improved by digital filtering processing.
- (3) Observation of the original ECT images has provided useful information compared to that of a CBF-ECT image.
- (4) Delayed-scan image has demonstrated the accumulation of 133-Xe in ventricles and white matter.
- (5) Dynamic map of 133-Xe was observed by deconvolutional processing.

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CLINICAL EXAMINATION OF TOMOMATIC 64 ECT - ANALYSIS BY DELAYED SCAN. T.Tanizaki*, T.Kasuga**, T.Kobayashi**, H.Makiahita*, M.Miyasaka*, T.Fugita*, S.Kato**, K.Sugita**. *Kakeyu Hospital. Maruko. **Shinshu University School of Medicine.

After conventional cerebral blood flow measurement, we measured remaining activity of Xe-133 by serial scans (delayed scan). Using these images, we performed clinical analysis of ischemic and hemorrhagic lesions. Pattern of remaining activity of Xe-133 was divided into three groups.

- 1) Lesion side had higher activity than healthy side.
- 2) Lesion had same activity as healthy side.
- 3) Lesion had lower activity than healthy side.

In this report, we analysed correlation between dynamic change of remaining activity of Xe-133 and time course of disease. In ischemic lesion, acute and subacute cases were in first and second groups. Chronic cases over 6 months were in third group. In hemorrhagic lesions, there was no correlation between dynamic change of Xe-133 and time course of disease. There were no thalamic hemorrhage cases in third group. We are now analysing correlation between dynamic change of Xe-133 and size of lesion, degree of collateral circulation and so on. Finally we stress upon clinical significance of original ECT images.

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CEREBRAL BLOOD FLOW MEASUREMENT BY SPECT (CEREBRAL VASCULAR RESPONSE TO DIAMOX). N.Shirahata, H.Ochi*, S.Nishimura** and A.Hakuba**. Neurosurgery of Yamamoto-Daisan Hospital, Nuclear medicine* and Neurosurgery** of Osaka City University. Osaka.

Cerebral blood flow (CBF) was measured in 90 stroke patients before and after intravenous administration of Diamox (acetazolamide) injection by using TOMOMATIC 64 which is a device of SPECT for CBF study. 133-Xe inhalation method was used. The difference between CBF before and after Diamox injection was calculated in each pixel. These values were divided into 16 color grades and reconstructed into a picture. In normal cases, CBF in each pixel increased 20-30% after Diamox administration. In acute stage of ischemic cerebral vascular disease, CBF was less increased in the ischemic region. In the case of bilateral internal carotid artery occlusion, intracranial steal phenomenon was observed before internal carotid to posterior cerebral artery bypass operation by using saphenus vein. After surgery the phenomenon disappeared. In the case of Moya-Moya disease CBF was less increased in cerebral cortex. The response to Diamox is useful for the study of cerebral hemodynamics.

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REGIONAL CEREBRAL BLOOD FLOW MEASUREMENT BY Xe-133 INHALATION AND ECT WITH GAMMA CAMERAS, QUANTITATIVE ANALYSIS. K.Matsumura, H.Maeda, S.Toyota, T.Nakagawa, T.Kitano, N.Shinoda, M.Kakegawa and S.Matsui. Department and Clinical Lab. of Radiology, Mie University Hospital, Tsu and Toshiba Co., Nasu.

A method for measurement of regional cerebral blood flow (rCBF) by Xe-133 inhalation and ECT with gamma cameras was investigated. The preliminary experiment on this convenient and noninvasive method reported at the previous meeting was further investigated in this study. Using an ECT system (Toshiba GCA-70AS) with dual opposed gamma cameras fitted with high sensitivity collimators, a sequence of ECT scan was performed with a rotation speed of 180/30sec. during and after a 1 min. administration of Xe-133 (30 mCi/l). Following the integration of 30sec. data into one-minute data, the tomographic images were reconstructed using convolution algorithm. According to the method proposed by Kanno and Lassen functional images were constructed. "Early picture method", yielding better quality of images and revealing more definitive evidence of decreased rCBF due to cerebral infarction, was considered to be better method as compared with "sequence of pictures method". The method for quantitation of rCBF following correction of Compton's scatters was also investigated.