

1

NEURONUCLEAR MEDICINE: A NEW HYBRID ECT, "HEADTOME" AND ITS APPLICATION FOR BRAIN STUDIES. K.Uemura, Div. of Radiology, Research Institute of Brain and Blood Vessels. Akita.

The most remarkable advancement of recent neuronuclear medicine is three dimensional regional physiological study using a emission computed tomography (ECT) and positron emitted radiopharmaceuticals. In the situations, we have been developing a original high speed ECT system; "Headtome" which can be used for the both single photon and positron emitters. The detailed description of the systems were reported in the paper No. 19-21 by I.Kanno, Y.Miura, S.Miura. Transaxial tomographic imaging of conventional brain scan was effective for the lesions of base of the brain and post-surgical conditions. 3-D regional cerebral circulation can be examined also by single photon ECT and emitters. The study should be useful for the hospital which could not have a inhouse cyclotron. 3-D imaging of regional cerebral circulation was studied by the ECT system and continuous intracarotid-infusion of Kr-81m. With the study, distribution of decreased regional blood flow was imaged clearly in the patients with cerebral infarction. The fast scan time of "Headtome" is applicable to new method developed by I. Kanno and N.A.Lassen for noninvasive 3-D cerebral circulation study. This study is now under development.

2

LUNG AND MEDIASTINUM. Kikuo Machida. Central Department of Radiology, University of Tokyo.

There are many imaging modalities clinically in the diagnosis of chest diseases, and each modality has its own characteristic, merit and demerit. In the daily hospital practice, it is important to select the reasonable methods to reach the final diagnosis. As the first step, chest X-P is very important because of its simplicity and rich information. Radionuclide imaging (RN) comes next to chest X-P, with conventional tomography and transmission computed tomography. These methods are non-invasive. It depends upon the clinical likelihood what should be performed initially among these secondary modalities. As the third step, there are invasive methods such as bronchography, angiography etc. It is widely accepted that RN is very suitable to image the function of the organ. Pulmonary perfusion and ventilation can be

2 continued

clearly shown by using radio-isotopes, and Ga-67 scintigram is useful in the diagnosis of chest malignancy in spite of the lack of specificity. In near future with the development of hospital cyclotron, positron emission CT is one of the way for us to proceed and clinical application of C-11, O-15 and N-13 is expected. Single photon CT is also expected to be accepted as clinical modality.

3

LIVER-SPLEEN DISEASES. T. Aburano and A. Tada. Department of Nuclear Medicine, Kanazawa University, School of Medicine. Kanazawa.

The present state and future of nuclear medicine were discussed, compared to ultrasound and computed tomography.

In the detection of focal hepatic lesions, a radionuclide imaging with Tc-99m-colloid has been accepted as a useful screening procedure, because of the feasibility of overview of the entire liver as well as the relatively high sensitivity. However, in the present study, radionuclide imaging and ultrasound combined showed a sensitivity of 85%, while radionuclide imaging alone showed a sensitivity of 80%. The major deficiency of radionuclide imaging was the relatively high incidence of equivocal findings, such as small defects in the area of physiological shadow or extrinsic pressure caused by disease process in adjacent organs and structure, or inhomogenous activity of radiocolloid. In such equivocal cases, both ultrasound and computed tomography could decide the existence of focal lesions accurately. In the characterization of focal hepatic lesions, the diagnosis of hepatoma was easily made by radionuclide angiography and/or Se-75-selenomethionine tumor scintigraphy, whereas ultrasound was very decisive to diagnose a liver cyst.

In the evaluation of diffuse hepatic diseases, radionuclide imaging could provide functional as well as anatomical informations of hepatic and extrahepatic organs.