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RADIONUCLIDE STUDY OF THE LUNG. K.Kawakami. Dept. of Radiology, Jikei Univ. School of Medicine. Tokyo.

Radionuclide study is utilizes for early detection and regional assessment of ventilatory and perfusion abnormalities by imaging and quantifying the distribution of radioactivity in the lung. In this lecture, the procedures of the radionuclide study of the lung, physiological meaning of the data,and the relationship between the results of radionuclide study and that of conventional methods were discussed. The procedure of Xe-133 inhalation study consists of mainly three phases, namely washin, equilibrium and washout phase. Regional distribution of residual volume is measured in equilibrium phase. A mean transite time, calculated from washout phase, is appraised as one of sensible indices of airtrapping. Krypton-81m gas is also available in most of institutions. This gas is useful for evaluation of ventilatory disorders during tidal breathing, and for repeated study in short interval. A bolus inhalation method of this gas is easy to perform and offers various informations on pulmonary physiology and disorders of ventilatory mechanism. Radionuclide study is also useful for detection of $\dot{V}/\dot{Q}$ mismatch. ECT is recently utilized for quantitative evaluation of blood flow distribution and ventilation and perfusion ratio. This modality will be offer new informations of pathophysiology of the various pulmonary diseases.

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RADIOIMMUNODETECTION OF CANCER. T. Koji. Nagasaki University School of Medicine. Nagasaki.

Among the major topics of interest in cancer immunology, the evaluation of the imaging obtained by the use of radiolabeled antibodies to tumor specific or tumor associated antigens was summerized historically and prospectively. The concept of injecting anti-tumor cell antibodies to localize tumors was first introduced in experimental systems by Pressman et al. (1957). Since then, various trials have been achieved with human tumors using specific or nonspecific tumor localizing antibodies diagnostically. In 1970's, successes in immunodiagnosis with the antibodies to oncofetal proteins also have been reported. Recently, there are numerous papers dealed with a series of external scanning by the use of monoclonal antibodies that bind selectively to tumor cells. Since 1978, we have been studied the radioimmunodetection of cancer using radiolabeled anti-α-fetoprotein (AFP) antibody or anti-carcinoembryonic antigen (CEA) antibody. In patients with hepatoma which produce AFP, approximately 50 % of primary tumors were detected by this methods. Also, in patients with CEA prodicing various tumors, 50 % of primary or metastatic tumors were detected. This new noninvasive method will be expected for the clinical use to cancer detection by the selection of appropriate nuclides or antibodies.

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NUCLEAR MEDICINE IN THYROIDOLOGY. S.Iino. Department of Internal Medicine, Showa University Fujigaoka Hospital, Yokohama.

The number of the test tubes used for the determination of thyroid hormones in 1981 counted about 7,450,000, which was the second large number to those used for the determination of tumor materials such as CEA and AFP. The use of newly developed FT4 and TBG is gradually increasing, since FT4 is considered to be the most valuable method to detect the state of the thyroid function, and, TBG to detect the amount of major T4 binding site. It is noted that I-131 was replaced by I-125 in in vitro tests and by I-123 or Tc-99m in in vivo examinations. Ga-67 and Tl-201 were also introduced for the scintigraphy of the thyroid gland, but their value in the defferentiation of the malignant tumors from benign ones was still equivocal. The amount of I-131 used for the treatment in 1981 was 45,516mCis, which is about twice as much as the doses used 6 years ago, indicating the increase in the number of Graves' patients treated with I-131.

It is expected in near future that the method to detect or to determine the anti TSH receptor antibody or FT3 in the serum will be introduced and the radioimmunodetection method will also successively developed to detect the presence and the localization of some kinds of malignant tumors.

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SCINTIGRAPHY IN TUMOR DIAGNOSIS. H.Ochi Department of Radiology, Osaka City University Medical School, Osaka

The number of scintigraphy a year is around 8000 in our hospital. Liver,bone,tumor and thyroid scans make up two third of total examinations. I presented many interesting cases which scintigraphy was very useful in diagnosis.

1) Liver-spleen scan: On the screening test of the liver,it is said that the scintigraphy is the first choice in the decision tree. Small focal defect more than 1.5cmφ could be detectable with the multiprojection images,erect position images and single photon emission CT. But we should know about the limitations and pitfall of the scintigrams.

Hepatoma; Hepatoma,where positive gallium uptake into a "cold" lesion on a colloid liver scan,has been shown to be quite specific for malignant hepatoma. At the same time in hepatoma,there are many extrahepatic metastases such as bone,lung and lymph nodes. So whole body gallium scan is very useful for eary detection of extrahepatic metastases of hepatoma.

Tumor of the right diaphragm; In a case of fibrosarcoma of the diaphragm,scintigraphy combined with colloid liver scan and MAA lung perfusion scan was useful.

2) Bone scan: Bone scan is the most sensitive examination in detecting skeletal involvement in patients with malignancy. There are various kind of bone scintigrams