

Symposium I.

Diagnosis of Liver Diseases with Radioisotopes (in vitro, in vivo)

Combined RI Examination Methods of the Hepatic Tumor

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With the combined radioisotope examination of the liver using α_1 -fetoprotein radioimmunoassay, dynamic radioisotope angiography of the liver, ^{75}Se -selenomethionine liver image and ^{67}Ga - or ^{169}Yb citrate tumor scintigram in addition to ^{198}Au -colloid liver scan, we tried to improve the radioisotope diagnostic accuracy of the hepatic tumor and evaluate the nature of focal hepatic defects in ^{198}Au -colloid liver scan. The use of ^{198}Au -colloid of $^{99\text{m}}\text{Tc}$ -sulfur colloid in evaluating the Kupffer cells, ^{131}I -Rosebengal or ^{75}Se -selenomethionine in evaluating the parenchymal cells, ^{131}I -human serum albumin or $^{99\text{m}}\text{Tc}$ -pertechnetate to define the vascular spaces and ^{67}Ga - or ^{169}Yb -citrate in evaluating the tumor affinity have established. Since performing the α_1 -fetoprotein radioimmunoassay, we set the lowest α_1 -fetoprotein positive value of hepatoma to 200 $\mu\text{g}/\text{ml}$. With this value, most of hepatoma cases could be differentiated from other diseases. However, 4 false negative cases were experienced. α_1 -fetoprotein radioimmunoassay and ^{198}Au -colloid liver scan with both anterior and right lateral view should be performed for routine practice. When α_1 -fetoprotein was negative and there are no scan defects, radioisotopic diagnosis is normal. In positive α_1 -fetoprotein and no scan defect cases, the selective angiography of the liver is the following procedure necessary because of high probability of hepatoma. In the presence of clear

defects in the ^{198}Au -colloid scan, radioisotope combined examinations of the liver could play a great important role to evaluate that nature. ^{75}Se -selenomethionine showed high uptake in hepatoma and low uptake in metastatic cancer, cholangioma and benign focal lesions. Radioisotopic angiography using $^{99\text{m}}\text{Tc}$ -pertechnetate revealed that high radioisotope uptake was noted in hepatoma at arterial phase and low uptake in metastatic cancer, cholangioma and benign lesions. Both ^{75}Se -selenomethionine image and radioisotope angiography of the liver were especially useful in hepatoma. The ^{67}Ga - or ^{169}Yb citrate were used in negative α_1 -fetoprotein lesions to differentiate malignant lesions from benign lesions. However, these radioisotopes showed appreciable accumulation in abscess as well as in malignant lesion.

Using the combined radioisotope examinations of the liver, we could improve the radioisotope diagnostic accuracy of the hepatic tumor and evaluate the nature of the focal hepatic defects in ^{198}Au -colloid liver scan. However, these combined radioisotope examinations had a few limitations. One was the presence of both negative α_1 -fetoprotein and no scan defect hepatoma. The other was that in one case of malignant lesions, tumor affinity agent did not show appreciable radioisotope accumulation.