studies were performed, by using cyclotron produced ^{13}N-labeled ammonia and delayed line γ-camera interphased with on-line computer system.

1) Animal experiment: Dynamic scintigraphy of thoraco-abdominal region of a rabbit after intrasigmoidal as well as intravenous administration of ^{13}N-ammonia were performed.
2) Theoretical consideration of the functional image of liver: According to the results of the animal experiment, a model of ammonia metabolism having the minimal complexity necessary to represent data in the case of intrasigmoidal administration was proposed. Starting from the solution to the differential equation describing the model, relevant parameters characterizing the dynamic curve of liver were deduced. The relationship between these parameters and the intrahepatic portal blood flow as well as rate constant of uptake of ammonia by hepatic cells was investigated.
3) Clinical application: Dynamic scintigraphy of liver and heart of a patient barign liver cirrhosis after intrasigmoidal administration of ^{13}N-ammonia (pH 8.1) were performed. Simultanously, continuous measurements of radioactivity at the left side abdomen and the left temporal region were done by using a scintillation detectors for renography. Successive measurement of radioactivity of blood was also carried out.
4) Construction of functional images of liver and heart: By using digital radioisotope image of liver and heart of the patient after intrasigmoidal administration of ^{13}N-ammonia, the maps of above described parameters on the liver and heart (Functional image) were constructed.

Studies on Portohepatic-Hemodynamics by Method of Injection of ^{99m}Tc-Pertechnetate into Small Intestine under the Scintillation Camera

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After a bolus of ten mCi of ^{99m}Tc-pertechnetate in a volume of 1～5 m*l* was injected into upper-small intestine through Bilbao-Dotter tube, RI image of the liver, spleen and the heart were recorded in VTR by scintillation camera. Time-activity curves of the liver and the heart were taken up from data-store/play-back system produced by Toshiba and Nuclear Chicago, setting up ROI (regeon of interest) on the both lobes of the liver and on the heart respectively.

In various liver diseases, studies of portohepatic-hemodynamics were performed with this method. Time-activity curves were analyzed, and following results were obtained.

①Time-activity curves (TAC) were classified into following 3 types.

Type 1 has high-tidal wave in TAC.

Type 2 has not high-tidal wave, but has peak value.

Type 3 is gradually increasing curve.

And then, patterns of TAC in various liver diseases could be described as follows.

In normal cases, TAC were L1 > H2.

In chronic hepatitis, TAC were L2 ≒ H2.

In liver cirrhosis with marked esophageal varices L3 ≪ H3, and this results suggest that there were many current portocardiac bypass.

(Here L and H represent TAC of liver and heart. 1, 2, 3 mean types of TAC.

>, < mean comparison of values of TAC in each peak)

— Palameter-analysis was made in this TAC.

Values of KL/KH, PL/PH and tc were decreased with progress from the cases of chronic hepatitis to the cases of liver cirrhosis compared to normal cases.

(Here indicates K; initial velosity in TAC P; peak value in TAC tc; crossing time)

We want to develop this method and clarify the portohepatic-hemodynamics in detail.