Radioisotope renography has been practised for more than ten years as a safe but qualitative individual renal function test since Taplin et al introduced this technique.

No quantitative interpretation of renograms has been successfully achieved yet, because of complexity.

Radiorenograms reflect dynamic equilibrium of intake, accumulation and excretion of the injected radioisotope into the kidney, and furthermore, background radioactivity from the tissue around the kidney.

We discussed pitfalls in radiorenogram analysis under the following headings:

(I) Technical aspects
(a) Injection method
(b) Misplacement of the scintillation counters
(c) Position of patient

(II) Intrarenal variables
(a) Background radioactivity
(b) Urine volume

To evaluate our analog computer simulation of the renogram, computed RPF values simulated independently by two operators (one veteran, other amateur) were examined by "blind-check" method. Good coincidence was found between RPF values calculated individually by two operators. We think the analog computer simulation of the renogram to be of clinical value.

Effect of Deoxidized Glutathione (Tathion) on Excretion of $^{203}$Hg-MHP in Kidney

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There are three kinds of measures to reduce the exposure dose of RI administered patient: (1) use of radionuclide with short half life and low energy, (2) use of scanner with large-sized crystal, and (3) use of agents to promote the excretion of administered radionuclide.

Scanning of spleen with $^{203}$Hg-MHP has become an important diagnostic method and is now widely used. However, the exposure dose to kidney amounts to 70–90 rad per 100 $\mu$Ci of $^{203}$Hg-MHP and cannot be neglected.

This study was undertaken to investigate the ability of Tathion to reduce the exposure
dose to kidney in $^{203}$Hg-MHP scanning.

Tathion is the commercial name of deoxidized glutathione and is a chemical antidote against Hg. It has the similar mechanism of action to BAL, but the detoxication effect is much less than the latter. The toxicity is very weak.

The distribution of $^{203}$Hg-MHP to the organs 3 and 5 days after the intraperitoneal injection was studied about ICR-JCL female mice 10 weeks old and 30 g in weight. It was confirmed that the kidney is a critical organ. Followingly, the effect of Tathion and BAL to prompt the excretion of $^{203}$Hg-MHP was tested by injecting these antidotes. The effective dose of Tathion was 2 mg and at this dose level this drug had almost the same strong effect as BAL.

However, if this dose level is applied to a man with 60 kg. of body weight, the dose reaches as much as 120 g. It is almost impossible to administer this amount of the drug without some side effects. Therefore, the intravenous administration of 1000 mg. of Tathion for 7 days after $^{203}$Hg-MHP scanning was tried clinically to supplement the effect, 100 mg. of BAL was added intramuscularly 1 and 6 hrs. later. This set of antidotes was tried about 10 cases and the renal excretion rate of $^{203}$Hg-MHP of this group was compared with that of 11 cases of control group. No significant difference was found between two groups. It is probable that the condition of renal function modifies the excretion rate of $^{203}$Hg-MHP. So, 10 cases with normal renal function were chosen from the above 21 cases and the excretion rate of the administered group of 5 cases was compared with that of the control group of 5 cases. It was then found that the excretion rate in the administered group was almost as twice as in the control group. However, this amount of increase of excretion rate will not be significant in reduction of exposure to kidney.

In summary, it was concluded that the use of antidote to reduce the exposure to kidney in $^{203}$Hg-MHP scanning was not such an effective way as was expected.

Comparison of Renal Examination by means of Scintillation Camera with Others

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The renal examinations by the scintillation camera using $^{99m}$Tc, and $^{131}$I-Hippuran are compared with other techniques, that is, radioactive isotope renogram, scanning using $^{203}$Hg-chlormerodrin, intravenous pyelography and selective angiography. The diseases for these examinations are renal stones, renal tumors, inflammations of the kidneys, transplanted kidney, aplastic kidney, uremias, cystic kidneys and some normal functions for control. The above mentioned six renal examinations are discussed. 10 mCi of $^{99m}$Tc was injected intravenously by one shot method to get a series of hemodynamic studies by scintillation camera. For renal function series 200 $\mu$Ci of $^{131}$I-Hippurate was used, the renograms were recorded continuously on a paper through simultaneously attached apparatuses another side of the patient and printed the count through the scintillation camera by divided method. For the scintigrams of the kidney 200 $\mu$Ci of $^{203}$Hg-chlormerodrin was used and recorded by scintillation camera or scanner.

The renal examination by radioisotopes can be done easily as a technique and less traumatic for patients. The change of quality of blood flow can be recognized better in dynamic scintigrams compared with the results of angiography. But as a point of morphological information, scanning and intravenous pyelography were superior than scintillation camera. Of course, the selective angiographic technique shows the best results. The pulses through scintillation camera are able to divided the count into two and printed continuously with a certain intervals. From this