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./g. 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 and 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, radioisotope 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 pluses through scintillation camera are able to divided the count into two and printed continuously with a certain intervals. From this

results a renographic curve are reproduced simultaneously. Therefore the scintillation camera can also act as a renogram. The renal examination with the scintillation camera is superior on a functional test with morphological changes, inframmation, some kinds of tumor, hydronephrosis, uremia and transplanted kidney. On the other hand, about the detail of morphological changes, other morphological examinations are superior. Several cases will be demonstrated at the meeting.

## Radioisotope Renogram in the Renal Transplantation

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From two to 11 serial renograms of transplanted kidneys were obtained in 11 patients using the following technic.

Ten microcuries of $^{131}I$ labeled orthoiodohippurate was injected intravenously. Radioactivity was determined with a heavily shielded 1×1 in. sodium iodide crystal scintillation probe connected to a ratemeter and recorder.

Using a time constant of 1 sec., full scale deflection of 30,000 counts/min., radioactivity was recorded over the homograft for 20 min. Patients were in the supine position. Crystal to skin distance was about 8 cm.

Persistence of normal tracings over a prolonged period has been observed thus far only in recipient of graft from identical twin.

In many homograft rejection crisis, the slope of the first forty-five seconds of the tubular phase ($\tan \theta$) has decreased.

One important factor for the success of kidney transplantation is early recognition and adequate therapy of the rejection crisis.

Improvement or deterioration of renogram configration parallels similar changes in clinical symptoms (pyrexia, increasing or decreasing urinary output etc.) and in other renal function tests, especially blood urea nitrogen, serum creatinine and creatinine clearance.

## Renogram of Homotransplanted Kidneys

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More than 140 series of $^{131}I$-hippuran renograms were obtained from 9 homotransplanted kidneys at our clinic for the past 2 years. We have obseved various complications such as rejection phenomenon, obstruction of the ureter, complete occlusion or stenosis of renal vessels, associated with reduction of kidney function. It is mandatory to make prompt differential diagnosis for proper treatment of these complications. The renographic findings of transplanted kidneys with stenosis of renal artery and renal vein demonstrated similar patterns and differential diagnosis was almost impossible by renographic method. While, non-functoining patterns of renography was illustrated at transplanted kidneys with complete occlusion of renal artery. It was not unusual that renography of homotransplanted kidneys at rejection phenomenon showed the same renographic patterns seen at complete occlusion of the ureters.

Differential diagnosis of these two categories seemed to be almost impossible, however, it was our vague impression that the former