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

demonstrated steeper elevation of C segment than the latter. The explanations for these findings are speculated as following; transplanted kidneys at rejection phenomenon are remarkably swollen, which results in intrarenal stasis of urine due to elevation of intrarenal pressure. Secondarily, dilatation of urine space in transplanted kidneys results in relative increase of dead space of urine accompanied by decrease of urine volume.

Thirdly, obstruction of urine flow are the sequela of rejection phenomenon itself due to edematous change in the ureteral mucosa.

Anyway, the mechanism of rejection phenomenon has not been well explained from the point of kidney function and each segment of renograms represents complicated factors of kidney function which is unable to give precise evaluation of each segment of renograms obtained from transplanted kidneys.

Clinical use of Indium 113 m for Kidney Scanning (II)

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Methods: Toshiba RDS-6 Scintiscanner, Cristal 3×2 inches (NaI), collimator 37 holes, Focus 10 cm honeycone were employed.

The kidney scanning was begun immediately and performed within 30 minutes after intravenous injection of 6 mCi of Indium 113m with patient usually prone and occasionally supine.

Material: Until recently, chlormerodrin (Neohydrin) labeled with radioactive mercury (^{203}Hg) was employed in kidney scanning. However, the renal exposure from the radioactive material was high.

About a half year ago we reported kidney scanning, using Indium 113 m FeEDTA or FeDTPA ascorbic acid, for renal localization.

And presently, 500 mg of probenecid are given per os 30 minutes perior to the scan in an attempt to block renal filtration of Indium 113 m.

Results: Indium 113 m FeDTPA ascorbic acid was better suited for use in kidney scanning than Indium 113 m FeEDTA because of its high ratio of kidney/liver were found in experiment in rats.

In addition, the scan after made preparation of "Probenecid" showed better localization of Indium 113 m in the kidney than no "Probenecid" in man.

The usefulness of kidney scanning using Indium 113 m can be seen in the following,

(1) detection of renal position, size
(2) differential diagnosis of abdominal masses in child.

Studies on Measurement of Plasma Volume and Extracellular Fluid Volume (Radiosulfate Space)

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The plasma volume and the extacellular fluid volume (E.C.F.V.) are generally measured b ythe isotope dilution method, in which those volumes are calculated from single blood samples or obtained by the extrapolation of the disappearance curve to the time of injection.

The plasma volume is, as a rule, calculated fro mthe ten minutes sample.

In measurement of the E.C.F.V., however, some investigators calculate it from the twenty minutes sample, but others obtain it by the