complex (TCAC), new renal scanning agents developed by the authors. These agents were applied to a total of 26 cases which include renal cancer (9 cases), hydronephrosis (7), renal cyst (2), uremia (1), etc. The new scanning agents were administered to the patients, and radioisotope angiograms and functional renal images were taken by means of a γ-camera.

Preparation of the agents was based on the method of Dr. Tanaka, one of the present authors. The radioisotope dose to a patient was 4 to 10mCi.

Results: In cases with normal renal function, both TMA and TCAC enabled angiograms to be obtained 10 to 30 seconds after injection, and renal images became clear 10 to 60 minutes after injection, TMA and TCAC distribution in livers was extremely little.

In the case of renal tumors, the radioisotope perfusion image in tumor lesions was observed immediately after injection, and the functional image of tumor became a cold area. No distinct difference was found between renal images obtained by TMA and TCAC.

Even in the case of renal insufficiency due to obstructive uropathy, TMA and TCAC were excreted satisfactorily.

Renal Dinamic Study with ^{99m}Tc-DTPA(Sn) and The Comparison with Other Renal Scanning Agents

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The purpose of this study is to describe the results of dynamic studies with several ^{99m}Tc labeled compounds and ^{131}I-hippurate, and to discuss those clinical usefulness.

After 5mCi bolus injection of ^{99m}Tc-DTPA, the data were recorded in VTR for 20 minutes. The injected doses of ^{99m}Tc-EDTA and ^{131}I-hippurate were 5mCi and 200μCi respectively. Serial posterior images were obtained every 5 seconds for 10 to 30 seconds followed with 3-minute images at 2 to 5, 7 to 10, 12 to 15, and 17 to 20 minutes. Area of interest histograms of the each kidney were obtained from tape play back. Routinely the conventional renogram and renal scan were performed.

With ^{99m}Tc-DTPA we could obtain the clear images on vascular, parenchymal, and excretory phase, and also AOI histograms. In other words the dynamic study with ^{99m}Tc-DTPA includes RI angiography, RI excretory urography, and AOI renograms.

On vascular phase we get informations concerning abdominal aorta, the blood supply of the each kidney and spleen, and vascularization of the space occupying lesions which is useful for the differential diagnosis.

The time abdominal aorta appears correlates with the circulation time.

Useful informations about urinary tract were obtained, therefore we could detect the obstructive site of ureter and tumors or stones of the pelvis.

In the severely disturbed renal function the delayed images with ^{131}I-hippurate were superior to those with ^{99m}Tc-DTPA.

We experienced two cases whose conventional renograms showed obstructive pattern but AOI renograms with ^{99m}Tc-DTPA showed

excretory segment, which may probably indicate the glomerular function is maintainted almost normally compared with the tubular function.

The absorbed radiation doses of ^{99m}Tc-DTPA were total body 0.011, kidneys 0.029, male gonads 0.020 and female gonads 0.021 rad/mCi respectively.

^{99m}Tc-DTPA was stable and the laveled ratio was over 99% after 6 hours of preparation.

Comparison of ^{99m}Tc-EDTA, -DTPA and ^{131}I-Hippuran in Renoscintiphotography

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Recently ^{99m}Tc-compounds are used as renal scanning agent in many labolatories. We compared the renoscintiphotos using ^{131}I-hippuran, and other ^{99m}Tc-chelates, DTPA and EDTA.

Before clinical study, whole body distributions of ^{99m}Tc-DTPA and-EDTA were investigated by macroautoradiography which was revealed efficient accumulation to the kidneys and not to the liver. Two were accumulated mainly to the renal cortex in the early time after injection, 2–3 minutes after they moved to the medulla. Same as other experiments which we had carried out few years ago with canine kineys by ^{51}Cr-EDTA, 10–15 minutes after injection ^{99m}Tc-EDTA appeared again in the cortex. This mechanism was not clearly explained, but it was supposed to be caused by recirculation or chemical transformation of these substances.

The instrumentation used included a Pho/Gamma HP camera (Nuclear Chicago) interfaced with a CDS 4096 computer and a magnetic tape system. With it we can obtain sequential scintiphotos and simultaniously store numerical information on magnetic tape. 2–4 millicuries of ^{99m}Tc-DTPA and -EDTA, 300–500 microcuries of ^{131}I-hippuran weae rapidly injected. Sequential scintiphotos (DTPA, ED TA) were obtained every 5 seconds for the first 2 minutes, and 8 scintiphotos every 2 minutes after injection. Area of interest renograms were obtained from the data which were stored on magnetic tape.

30 cases in which we had 3 allografts, 6 tumors and 6 cysts were studied. In the case with moderately impaired kidneys, espcially acute-rejected allografts, ^{131}I-hippuran was more effective substance to obtain slight change of images than other two chelates. In these cases we could not get the fine vascular images using ^{131}I-hippuran. Because of the low patient dosage of ^{99m}Tc-DTPA and -EDTA, substatially larger amounts of activity can be given and short interval serial images, vascular images, can be obtained. The images of ^{99m}Tc-EDTA which delineated the thickness of renal parenchyma most clearly showed us the reversibility of hydronephrotic kidneys.