

only helpful to the diagnosis of the bladder tumor, prostatic and intra-scrotal diseases, but also valu-

able to the evaluation of the tumor treatment.

### **Dynamic Studies of Placental Blood Flow (PBF)**

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A method for the continuous recording of utero-placental blood volume has been described on 91 pregnant women by the use of  $^{99m}\text{Tc}$ -albumin.

Immediately after intravenous infusion of  $^{99m}\text{Tc}$ -albumin (1 mCi), the gamma-camera was connected with the 32K computer to demonstrate the ROI on the placental and femoral artery as curves.

The fetal radiation dose was as small as about 10 mrad, and may be considered virtually free of any embryologic risks.

The patterns of placental blood flow (PBF) on

the placenta were studied.

These changes were observed most frequently in complicated prematurity, such as toxemia, intrauterine fetal death, placental insufficiency or diabetes mellitus.

The alterations in wave pattern which appeared attributable to spasm or ischemia of arterioles, was agreed with pathologic diagnoses of the placenta.

The relationship of the placental blood flow and clinical data, especially urinary estrogens or renal function, have been discussed.

### **Clinical Evaluation of Renoscintiphoto in Pediatrics**

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Renoscintiscameras were performed on 147 children, aged two to fifteen years, during this last 5 years in Kitasato University Hospital.

In pediatrics, among many cases of renoscintiphoto, they have contributed to the clinical diagnosis of the urinary tract.

Particularly in the newborn infants the reno-

scintiphotos have been considered to be more useful and safer than intravenous urograms and the other X-ray examinations.

In addition, we reviewed two instances of urinary tract disorders; infantile polycystic kidney and congenital hydronephrosis.

### **Tomoscintigraphy by PHO/CON, Computed Tomography and Echography of the Kidney: A Comparative Study**

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Tomoscintigraphy by the PHO/CON TM Multi-Plane Imager System (PHO/CON), computed

tomography (CT) and echography (ECHO) were compared with regard to detection of renal lesions.

A hundred patients with suspected renal disease were studied by PHO/CON. Both CT and ECHO were applied to 14 cases and either CT or ECHO to 35. A  $^{99m}\text{Tc}$ -DMS (dimercaptosuccinate) was used for renal tomoscintigraphy. In patients with suspected renal lesions in the noncontrast CT study, a urographic contrast medium was injected intravenously for enhancement of visualization.

The kidneys were scanned in longitudinal planes by PHO/CON, in transverse planes by CT, and in free planes by ECHO.

Six cases are presented in details.

In detecting the renal space occupying lesions, scintigraphy by PHO/CON was the best screening examination of the three modalities, since the entire

organ was easily imaged. PHO/CON provided valuable information on renal functions, but permitted the least definitive evaluation of renal masses, especially in the nonfunctioning kidney.

CT and ECHO were more useful in distinguishing between a renal cystic disease and a solid renal neoplasm and in visualizing the cross-sectional anatomy.

CT had better resolving capability and less dependence on the operator than ECHO. The disadvantages of CT are a higher initial cost and exposure to radiation.

The effectiveness of ECHO was restricted by marked obesity and bowel gas, but it features a low cost and no radiation exposure.

### **Body-Background Defects in the Renoscintiphotos after Renal Transplantation**

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90 cases received renal transplants at Kitasato University Hospital last five years. All of them were studied with renoscintiphotos using  $^{99m}\text{Tc}$ -DTPA and  $^{131}\text{I}$ -hippuran. We have 4 cases of lymphoceles after transplantation. 3 cases of them were studied by both ultrasonography and renoscintiphography.

The ultrasonography revealed lymphoceles in all three cases. A lymphocoele locating outside the transplanted kidney cannot be detected by renoscintigraphy. Renoscintiphoto is not recommended as the first procedure when lymphocoele is suspected clinically. Ultrasonography seems to be more useful in detecting these complications.

### **Serial Radionuclide Studies for Evaluation of Renal Transplants**

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Radionuclide quantitative function studies for evaluation of renal allografts were performed on 11 patients. Twenty-four studies were made on various states (normal 12, acute rejection 7, chronic rejection 2, ATN 2, urinary obstruction 1) using  $^{99m}\text{Tc}$ -DTPA and  $^{131}\text{I}$ -hippuran.

For the dynamic studies, 10 mCi of  $^{99m}\text{Tc}$ -DTPA was injected intravenously as a rapid bolus and sequential images of the kidney were recorded every one second for 80 seconds using a gamma scintillation camera and on-line minicomputer

system (HITAC-10, 16 kW). Then, 300  $\mu\text{Ci}$  of  $^{131}\text{I}$ -hippuran was injected and serial images were recorded every ten seconds for 20 minutes in the same method. During these studies, several scintiphotos were also obtained using the polaroid camera.

RI dynamic curves were obtained from the region of interest in the kidney, displaying on CRT.

Analysing Tc-DTPA dynamic curves, five parameters were calculated: (A)  $T_{\max}$ , (B)  $T_{1/2 \max}$ ,