3 continued
And, about 30-40% of liver cirrhosis could be diagnosed by radionuclide imaging alone. However, ultrasound and computed tomography could provide different informations, such as vascular changes associated with the extent of liver disease. Moreover, computed tomography could diagnose the moderate and severe changes of fatty liver or hemosiderosis accurately.

In the evaluation of cholestasis, hepatobiliary imaging was the least accurate. However, if ultrasound or computed tomography showed no evidence of obstruction, Tc-99m IDA study could separate patients with totally obstructed biliary flow, who require additional testing to define the correct therapy, from those with patent biliary flow whom medical management was indicated initially.

In the evaluation of spleen disease, radionuclide imaging was also more useful because of the evaluation of functional as well as anatomical situations of spleen. The future of nuclear medicine in body imaging would be a radionuclide tomography. In the deep seated lesion, the resolution of radionuclide tomographic camera or scanner was much better than that of conventional high resolution gamma camera.

5 continued
Each frame is then processed individually into 10 tomographic images, and these 6 frames of a cardiac cycle were interpolated to give 12 frames within a cycle in each of the 10 tomographic depths. The tomographic imaging of ECG gated cardiac pool was also performed using Tc-99m in vivo labeled red blood cells in the same position as the myocardial perfusion study to be compared.

ECG gated emission tomography of cardiac pool: Single photon emission tomography was reconstructed from multigated cardiac pool images (6 frames within a cardiac cycle) using a scintillation camera. Each image of a cardiac cycle was obtained during 100 cardiac cycles, and 36 different angle images around the chest were obtained by rotating a patient in a sitting position as the original data to be processed. We can get many informations from these 3-dimensional cardiac imaging, and it enables us to recognize the cardiac contraction visually. Moreover, ECG gated myocardial tomographic imaging has succeeded in visualizing the myocardial perfusion and the wall motion simultaneously, which improved the detectability of the small ischemia compared with the conventional myocardial perfusion imaging.

To accomplish the complete 3-dimensional quantification, positron emission tomography should be necessary, however, these image reconstructions also give us many useful informations concerning 3-dimensional radionuclide distribution.

5
NUCLEAR CARDIOLOGY: 3-DIMENSIONAL CARDIAC IMAGING BY RADIONUCLIDES. Y. Yonekura and Y. Ishii. Dept. of Radiology and Nuclear Medicine, Kyoto University Medical School, Kyoto.

Recently, the development of nuclear cardiology has succeeded in visualizing beating cardiac images utilizing a scintillation camera and a minicomputer. Although many useful parameters concerning cardiac performance are obtained through these images, these 2-dimensional images have some limitations. Then, we developed new methods to reconstruct 3-dimensional cardiac images. The purpose of present study is to demonstrate these 3-dimensional images as ECG gated moving images.

3-dimensional reconstruction of the left ventricular cavity (LV) from bidirectional multigated LV images: ECG gated LV images were obtained in RAO 30° and in LAO 30° simultaneously utilizing a bidirectional collimator by first-pass method. After detecting boundaries of LV on the consecutive frames of the ECG gated images manually, 3-dimensional image was reconstructed, assuming it as an ellipsoid.

Myocardial tomographic imaging by 7 pinhole collimator: Myocardial tomographic scintigraphy not only for static imaging but also for ECG gated imaging was accomplished using a 7 pinhole collimator, following the conventional TI-201 myocardial perfusion imaging with or without exercise loading. 6 frame per cardiac cycle imaging was accomplished during 500 cardiac cycles.

6
(6) KIDNEY AND UROGENITAL DISEASES. M.MIKI. JIKEI UNIVERSITY SCHOOL OF MEDICINE. TOKYO.

The proliferation of imaging modalities has resulted in new and often overlapping approaches to the evaluation of renal disease. So a logical and systematic approach to renal problems is important for the best patients care at the least expense.

Flow charts that describe an approach to unilateral abdominal mass are proposed by way of example. IVP should be performed first. It provides enough information to decide whether the mass is intrarenal or extrarenal. Radioisotopic imaging can provide almost same information. Especially in the allergic patient and in patients with renal failure, renal scans offer an important alternative to IVP for detecting structural disease. Functional measurements by renal imaging complement the high structural resolution provided by roentgenographic and ultrasound procedures. Ultrasound should be performed to determine whether the mass is cystic or solid. If ultrasonography or CT or both are not technically adequate or demonstrate questionable findings, a more aggressive procedure such as arteriography or venography are necessary. It is fact that widespread use of grey-scale ultrasonography and CT have reduced the need for renal angiography. But a normal ultrasonogram or CT scan does not obviate the need for angiography in a patient with clinical suspicion of renal tumor.
Serial renal studies with Tc-99m-DTPA, Tc-99m-DMSA and I-131-hippuran are discussed and compared with other imaging techniques such as roentgenography, ultrasonography and CT in many clinical cases.

Clinical evaluation and advantage of radioactive imaging techniques in urogenital organs are reviewed.

A positive tumor image on AFP producing testicular tumor of nude mouse is showed and the possibility of "tumor specific positive imaging" with labeled anti-tumor marker are suggested.

Radionuclide imaging methods of thyroid and thyroid tumor were reviewed and re-evaluated. These methods were discussed, as compared with other diagnostic methods. I-131 TSH as a new diagnostic radiopharmaceutical is also reported with the view of imaging thyroid and thyroid tumor, having TSH receptor.

Concerning thyroid and primary thyroid tumor, it is necessary to re-evaluate radionuclide imaging methods, because the recent development of imaging instruments and radiopharmaceuticals is so remarkable.

Most important method to diagnose a thyroid nodule is palpation, but now using recent high resolution camera and I-123, it is not rare to detect a small lesion which is not palpable.

A comparative study of radionuclide (I-123, Tl-203) imaging technic and other diagnostic methods (palpation, ultrasonography, CT) was done, concerning the thyroid nodule. Recently the thyroid tumor scintigraphy with Tl-201 chloride is popularized in Japan. Using our data, Tl-201 chloride scintigraphy was discussed. This scintigraphy have a high sensitivity in thyroid cancer, but a high false-positive ratio was found in benign thyroid adenoma. In any way, the scintigraphy using Tl-201 chloride is especially useful for the detection of the distant metastasis of thyroid cancer.

Anaplastic thyroid cancer concentrate Ga-

67 citrate in the lesion, but do not concentrate Tl-201 chloride. On the contrary, differentiated thyroid cancer do not concentrate Ga-67 citrate but Tl-201 chloride. It is concluded that the qualitative diagnosis of thyroid tumor is possible in some extent, using these radiopharmaceuticals.

The specific binding of radionuclide labelled TSH to thyroid and thyroid tumor recognized by our recent in-vivo study. H-3 TSH and I-131 TSH were found to concentrate in the rat thyroid tissue in higher ratio, as compared with other organs and surrounding extrathyroidal tissue. 7 patients with thyroid disease were studied by I-131 TSH scintigraphy. I-131 TSH image revealed hot areas corresponding 3 hot adenomas in 2 patients and several lymph node metastases in 2 patients with thyroid cancer.

These results show the potential for imaging of the tumor, having hormone recepter.