

no relation with the extent of resection, and almost came up to the preoperative liver area 3 months. However, 2 cases with the increase in liver area after the 3 months demonstrated a recurrence of the tumor without space occupying lesion. Therefore, the performance of

serial scans was very important to predict the recurrence, and also may serve as a useful method for estimating the behavior of liver tumor in response to chemotherapeutic agents and surgical treatment.

Review of RI Diagnostic Procedures for Hepato-Biliary Tract Diseases from the Surgical Viewpoint

M. KODAMA and H. NISHIKAWA

The Second Department of Surgery, Hiroshima University School of Medicine, Hiroshima

Liver scintigraphy was performed on 185 cancer cases (of which 118 had gastric cancer) during the period of February 1967 to September 1971 with a Pho/Dot II Scintiscanner and a Pho/Gamma III Scintiscamera manufactured by Nuclear Chicago Co. using ^{198}Au -colloid, $^{99\text{m}}\text{Tc}$ -sulfur colloid and ^{131}I -rose bengal. Of those with positive scans, 33 cases of metastatic liver cancer were confirmed by laparotomy or autopsy while there were 13 false positive cases in whom metastatic liver cancer could not be found on laparotomy nor autopsy.

Further, of those with negative scans, there were 96 cases with true negative findings in whom metastatic liver cancer was not present on laparotomy nor autopsy, while there were 9 cases with false negative scans. Thus, the overall diagnostic accuracy was 95%. Of the 13 cases presenting false positive findings, 8 were normal, 2 had deformity of the left liver lobe due to pressure from a cancer of the cardia, and 1 each had enlargement of hepato-biliary duct due to obstruction of the biliary tract, hypertrophy of the left lobe and progressive gastric cancer with disseminated metastases. Of the 9 cases with false negative findings, 7 had disseminated metastases of less than 3 cm in diameter and 2 had infiltrative metastases of the left liver lobe from recurrent gastric cancer.

During the above mentioned period, there were 12 cases diagnosed as primary hepatic

cancer, of whom 6 had hepatoma, 5 of whom had complication of hepatic cirrhosis. Hepatectomy was performed in 3 cases, of whom 2 died of hepatic insufficiency after surgery. The main causes for hepatic insufficiency following surgery are factors involving hepatic circulation. Therefore, the authors used a scintiscamera connected to an analog-to-digital converter with 1600 word memory and computer compatible magnetic tape system to obtain the local concentration curve of radioactive colloid in the remaining portion of the liver based on the local K value. The average K value determined by readings at 37 sites in 10 normal cases was 0.344 (S.D. 0.096), which agreed well with the K value obtained by conventional single probe techniques. When there is a decrease in the K value of the remaining portion of the liver, it may be considered due to local circulatory disturbance in the liver.

In 3 of the 5 cases of primary hepatic cancer in whom exploratory laparotomy was performed, anti-cancer preparations were administered locally by intra-arterial cannulation. It is possible to determine the degree of distribution of the anti-cancer preparation and the state of the tumor by administrations of an injection of ^{131}I -MAA at the same time by observing the tracings of the positive scan.

Procedures for alleviation of jaundice by biliary tract intubation was performed on 4 cases with obstructive jaundice, and the post-

surgical course was observed by ^{131}I -rose bengal hepatogram. This method is of less risk to the patient, is simple and provides

information on the liver function and presence of passage disturbance in the biliary tract.

Clinical Study by Computer Processing of Renoscintigrams

M. MIKI, T. MACHIDA, M. UEDA and T. MINAMI

Department of Urology, The Jikei University School of Medicine, Tokyo

While scintillation cameras have been extensively used for examinations of the kidneys, the information obtained has not necessarily been applied effectively to clinical diagnoses. We have attempted to enhance the clinical value of these examinations by using a computer to record and process all the RI images from the scintillation camera.

The apparatus used in our research consisted of a scintillation camera "Model RVE-203" linked to an Aloka data processing system with the computer JAC-120. Using a magnetic drum and tape for its external memory device, the apparatus is a capable of continuously recording at certain time intervals up to 100 channels of RI image changes with time. The collected data are reproduced on oscilloscope for three-dimensional display and to draw profile curves. With regard to any given region of interest, changes of RI can be expressed in curves, which may be called regional renogram.

Radioisotopes used were $200\mu\text{Ci}$ of ^{203}Hg -

chlormerodrin or $200\mu\text{Ci}$ of ^{131}I -Hippuran. With ^{203}Hg -chlormerodrin, 10 channels of scintigrams were obtained at 30-second intervals in the 5 minutes immediately following the intravenous injection, and 20 channels at 90-second intervals during the 30 minutes starting 10 minutes after the injection. With ^{131}I -Hippuran, 20 channels were obtained either at 15-second intervals in the 5 minutes or at 30-second intervals in the 10 minutes directly following the injection.

Processing the studying of these data give the following findings:

- (1) From the profile curves, split renal and regional functions can be appraised semiquantitatively.
- (2) RI changes with time in any given region of the kidneys can be obtained.
- (3) The three-dimensional display enables cold areas to be readily located.
- (4) Renal lesions can be discriminated by selective use of various RI and adjusting programs.

On Scintiscanning of Osteomyelitis and Bone Fracture

S. OMORI

*Department of Orthopaedic Surgery, The Jikeikai University,
School of Medicine, Tokyo*

In our department, we have applied bone scanning 562 times in the diagnosis of 482 cases of bone diseases and other forms of

trauma so far and have studied the diagnostic application of bone scanning on various bone diseases.