could not be made.

The usefulness of the brain scanning has not gained popularity in our country, but in some cases the contour and topography permit a precise pathological diagnosis. Un fortunately this is by no means always so, but it is hoped that still greater accuracy may be achieved by refining the technique.

Renal Scanning

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Since the development of scintiscanner by B. Cassen (1950) organ scanning has been building up its own clinically important field, paralleling the improvement of radiopharmaceuticals and scintiscanner. Although no one doubt the necessity of scanning of the thyroid gland, liver, pancreas, spleen and the other organs which can not easily be diagnosed roentgenologically, scanning is underestimated in the kidneys which can be examined accurately by X-ray. Since 1962 more than 200 renal scannings were performed using ^{203}Hg Neohydrin (chlormerodrin).

To obtain scintigraphic informations as many as possible, multi-cut off scanning is essential. The scintiscanner has a 2×2 inch sodium iodide crystal, a 37 hole lead collimator, a medical spectrometer, four thyratrons and four solenoid pens which enable one to get four scintigrams, each with a different recording condition simultaneously (cut off levels 20, 35, 45 and 55%).

As a scanning agent ^{203}Hg Neohydrin is most common. Recently ^{197}Hg Neohydrin became available in Japan and it is obvious that ^{197}Hg Neohydrin is preferable from the standpoint of reduced radiation exposure to the patient due to its short physical half-life of 65 hours. However, some colleague in U.S.A. is insisting that the deep-seated lesions such as brain tumor are more difficult to visualize with agents having soft gamma rays (^{197}Hg: 0.077 MeV) than with more energetic gamma rays (^{203}Hg: 0.279 MeV) in brain scanning. In renalscanning, on the other hand, our in vitro study using an Alderson Organ Scanning Phantom revealed that there was no difference in tumor detection rate between two nuclides, ^{203}Hg and ^{197}Hg. Our gamma-spectrometric analysis of ^{197}Hg Neohydrin showed less than 1 per cent ^{203}Hg contamination. Despite of the advantage of a lower radiation dose to the patient, too short half-lived isotopes such as ^{197}Hg is impractical economically, at present in this country. In most cases, therefore, 200 μCi of ^{203}Hg Neohydrin was administered intravenously and scanning was begun approximately one hour later.

Information can be derived from renal scintigram about the position, size, shape and internal configuration especially presence of space-occupying lesion. From these points of view, renal scan could be classified into seven types as following:

Standard type. Usually the kidneys are from 10 to 12 cm in length, from 5 to 5.5 cm in width scintigraphically and the discrepancy in length is no more than 1 cm. Discrepancy in size, either small or large, indicates some abnormality. Position, shapes should keep within normal variation and internal configuration should be homogenous. In a few instances patchy decrease occurs in renal pelvis and faint delineation of the liver is seen. This pattern includes all normal cases as well as false negative cases of glomerulonephritis, renal vascular disease, tumors of the kidney and renal stone.

Abnormal shape or position. Congenital anomalies such as fetal lobulation, pelvic kidney, or horseshow kidneys are readily detectable by scanning. Extrarenal masses may also displace the kidney from its normal position.

Enlarged type. The kidney is more than 13 cm in length and this type occurs unilaterally either with or without homogenous internal configuration. Polycystic kidney, tumors of the kidney and hydronephrosis due to ureteral stone etc. show this pattern.

Hypofunctional type. Renal size itself is not changed. Just an irregular radioactive uptake pattern "salt and pepper" is striking feature. This occurs in a variety of renal parenchymal disorders and in renal insufficiency from any cause. The liver is quite often visualized on the scintigram.

Contracted type. The kidney is less than 9 cm in length and discrepancy in size, unilateral decrease in uptake are noticed. Disease such as renal artery stenosis, aneurysm of renal artery, congenital hypolasia, or chronic nephritis is suspected.

Partially defective type. Cysts, neoplasms, localized inflammations, renal stones will produce filling defects on the renal scintigram if they are larger than 3 cm in diameter. Solitary cyst can hardly be differentiated from neoplasm renoscintigraphically.

Non-functional type. If impairment of bilateral renal function becomes severe like in nephrosclerosis or polycystic kidney, the kidneys will not be visualized. Unilateral failure to visualize may be associated with extensive parenchymal infection or neoplasm or arterial or ureteral occlusion or congenital hypoplasia.

As above-mentioned, although it is impossible to decide the final diagnosis from renoscintigram alone, it can play a definite role in selected cases such as renovascular hypertension or renal neoplasm.

Lastly, from our own experiences, advantages and limitations of this procedure are summarized as follows:

Advantages of the renal scanning

1. No special preparation of the patient is necessary.
2. Gas or contrast media in the intestinal tract and obesity do not interfere with recording of the renal scintigram or its interpretation.
3. The renal scanning can delineate discrete areas of varied function within the same kidney.
4. The renal scanning is a safe, painless and easy procedure.

Limitations of the renal scanning

1. Lesions less than about 3 cm in diameter will be missed.
2. Patient has to remain immobile for about one hour.

Symposium II. Diagnostic Use of Radioisotopes for Gastrointestinal Diseases

Analysis of the Blood Curve of Radioactive Iodine Labeled Fat

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^{131}I-labeled triolein and oleic acid have been widely used for the study of digestion and absorption of fat in the intestinal tract. Up to the date, however, theoretical observation of the blood radioactivity curve is scanty. For example, only the peak value and sum or mean of total radioactivity at 4, 5, and 6 hours following test meal administration have been discussed in many reports.

The blood radioactivity is seriously affected by many factors, such as gastric emptying time, mixture and digestion with duodenal juice, quality and quantity of the carrier, and stability or impurity of labeled fat. Therefore, we attempted to analyse the blood radioactivity curve and studied of the factors which influence on it by means of double isotope technique and thin layer chromatography.

I. Our analytic method

The radioactivity in plasma is plotted on a logarithmic section against time—BLOOD CURVE, and this curve is extrapolated to the initial decline phase—METABOLIC CURVE. Then an ABSORPTION CURVE is mathematically obtained by reducing the former from the latter. The absorption