

battery of time-activity curves selected from various parts of the kidney such as outer part of cortex and inner part of pelvis, any differences in the temporal events between these tracers were not evident, indicating such were tagged tubular fluid which ran preferentially down and up again along the course of nephrons. Impulse response of this tubular transit process of the parenchymal part of kidney revealed a bimodal distribution func-

tion.

On loading osmotic diuresis, the distribution function became unimodal with shortened spread, which corresponded with increased rapid flow component and reciprocal decrease of slow component, according to the radioxenon washout study simultaneously carried out, suggesting that the intrarenal urine and blood flow were invariably related.

Quantative Estimation for Results of Operated Obstructed Kidneys, Applying to Computer Analysis as Functional Image with $^{99m}\text{TC-DTPA}$

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RI-images on pre- and postoperative obstructed kidneys, hard to distinguish their functional improvements with IVP., were acquired as 45 pictures of each 20 sec. interval for computer analysis.

From regional renograms, functional images on both peak counts and its arrival times, some values for quantity were estimated in order to follow up the changes of the operated kidney.

Values from each 4 horizontal ROI of kidney were compared, resulting inversely related with counts and times in each region following to improve on operated kidney function.

Lated flow index value (LFI) as the expression

for dynamic function included each count and time were set up, and applied to the same follow up studies. That is:

$$LIF = \frac{1}{N} \sum_{i=1}^n \frac{\frac{PC_i}{BG} - 1}{\left(\frac{PT_i}{K}\right)^2}$$

where, $K=180''$ (DTPA), BG; background, PC; peak count, PT; peak time, showing gradation of kidney functions.

By this, in 7 of 10 cases, changes of kidney function were observed just as renal counter balance of Joelson, J.C. (1929).

A Study of the Diagnostic Usefulness of Serial Renal RI Images in Upper Urinary Tract Obstruction, Especially in Children

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Urinary tract obstruction and its complications occupy an important place in pediatric nephropathy. The nature and etiology of such obstructions are quite complex and the symptoms are most of such cases during in fancy and early childhood are considered as congenital. Stricture or obstruction at the ureteropelvic junction or at the lower end of the ureter is a congenital anomaly of relatively frequent occurrence which, even in mild cases, tends to be associated with flareups of urinary

tract infection, proves often to be therapyresistant and is likely to be overlooked at times. In the diagnosis of such upper urinary tract obstructions functional image by using renal scanning agents is of great use.

This radiodiagnostic procedure consists of taking serial scintiphotos of the kidneys in order, 4, 8, 12 and 16 minutes after the rapid intravenous injection of ^{131}I -hippurate using an Anger scinticamera which is placed externally against the

black of the patient held in the sitting position. Additional later scintiphotos may be obtained if necessary. Scintigraphic findings thus obtained are classified roughly into 2 types, normal and abnormal, according to their pattern of changes with time. In the normal type, the kidney, renal pelvis and ureter are successively visualized and then disappear, while the radioactivity in the bladder becomes progressively increased. In Contrast, the abnormal type, especially a pattern of obstructive type, is characterized by a delayed functional image of ^{131}I -Hippurate and its image retained or remained in the upper portion of the urinary tract.

We performed this procedure in children with

nephritis or pyelitis with a protracted course or repeated recurrences and evaluated the degree of functional integrity of the kidney and ureter from serial renal RI images. Findings thus obtained in part of the patients permitted us to confirm the presence of obstruction at the renal pelvis or ureter.

In this paper some of our cases with malformation or stricture of the upper urinary tract demonstrated by this radiodiagnostic procedure were presented, together with a comparison of renal scintigram and excretory pyelogram particularly with regard to their diagnostic efficiency in upper urinary tract obstruction.

Clinical Evaluation of Renoscintiphoto in Hydronephrosis

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Renoscintiphoto is one of the methods to assess functional impairment of renal tissue damaged by hydronephrosis and may predict the potential reversibility of the kidney function.

A total of 248, ^{131}I -Hippuran image studies in 89 hydronephrotic patients were reviewed.

After bolus injection of ^{131}I -Hippuran (200–500 uCi), renoscintiphotos were taken by means of Nuclear Chicago's Pho/Gamma HP scintillation camera. Minicomputer CDS 4096 was used to process the data.

The obtained images were divided into 3 main groups according to the figure, accumulation and excretion, and subdivided into four, three, and

seven subgroups respectively. Each group was compared with ROI renogram and scored 0 to 5, according to its function. Generally, small score means good function.

The total score of each case correlated to renogram pattern and I.V.P. pattern.

For clinical study, photographs of pre- and post-operative cases were studied using this score index. Operative cases scored below 5 showed significantly high reversibility of the renal function, while cases beyond 5 seldom restored their function.

This scoring method seems to be useful to predict prognosis of hydronephrosis.

Evaluation of Renal Images by $^{99\text{m}}\text{Tc}$ -DMS in Tuberculous Kidneys

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Renal imaging by $^{99\text{m}}\text{Tc}$ -DMS is useful in investigating the renal parenchyma. Excretory urograms generally show changes of calyces and pelvis in tuberculous kidneys, but hardly give clear images of the renal parenchyma.

Tuberculous 85 kidneys in 65 cases, 40 males were investigated by renal imaging with $^{99\text{m}}\text{Tc}$ -DMS (1-10 mCi) and renal images were compared with excretory urograms. The apparatus used were Aloka's RVE 204 and Nuclear Chicago's